Long-Term Investing: An Institutional Investor Perspective

Research Report, October 2014
Opening Comments

About this Research Project

Much has been written and said about the ‘problem’ of short-termism in financial markets, often accompanied by calls for more long-term investing. This research examines the conditions under which institutional investors might successfully adopt a long-term approach. We address this topic in a series of three inter-related papers.

Paper 1 sets the foundation for the research. It characterizes what it means to be a long-term investor, which we see as related to the latitude to invest for the long run through having discretion over trading, coupled with an approach to investing that focuses on the long term. Paper 1 provides an account of the determinants of investment horizon, as drawn from the literature. An interconnected web of influences is identified, reflecting the combination of investor circumstances, design of the investing environment, and the choices made by investors.

Paper 2 considers the incentive to become a long-term investor. That is, why do it? We set out the benefits of adopting a long-term approach. These largely relate to gaining access to a broader investment opportunity set, supported by the capacity to exploit opportunities arising from the actions and aversions of short-term investors. We identify three advantages held by long-term investors. These advantages are linked to eight investment strategies that are suited to investors with longer horizons. We also balance the benefits against the potential pitfalls. It is noted that long-term investing is likely to work largely because the long term is undervalued by the markets; and that it can be challenging to implement successfully.

Paper 3 deals with how investment organizations might be designed to successfully pursue long-term investing. Various recommendations and suggestions are offered for enabling a long-term approach. We propose four building blocks to address: orienting the organization towards the long-term; setting the right incentives; establishing a long-term investment approach; and harbouring discretion over trading. We also highlight the need to manage the principal-agent issues within multi-layered investment operations, the importance of building alignment, and the role of commitment.

This project is the product of collaboration between the Centre for International Finance and Regulation (CIFR) and the Future Fund, Australia’s sovereign wealth fund. CIFR has been largely responsible for undertaking the research, with the Future Fund offering guidance and encouragement. The Future Fund has also provided insights and examples arising from its own experience, which are peppered throughout. The output from this project is intended as a contribution to the body of public knowledge. We trust that it will prove useful to institutional investors, policy makers and industry observers.

How to Read This Document

This document represents a collection of the three papers, each of which is written on a stand-alone basis. Given its length, we thought readers may appreciate some assistance in finding the parts that most interest them. The papers contain three broad types of content, as listed below. To help locate content of a particular type, the primary nature of each section is listed in the Table of Contents that commences over the page.

a) General content – These sections address matters of a conceptual or practical nature, and contain the key messages and findings. They should be appreciated by readers with a broader interest, such as practitioners.

b) Literature reviews – All papers contain comprehensive reviews of selected topics, including: the debate over short-termism; determinants of investment horizon; illiquidity in asset markets; and ideas for encouraging long-term investing. These sections provide a useful summary of the existing body of knowledge in these areas.

c) Detailed examinations – Certain topics are examined in depth, including: illiquidity; dynamic strategies; performance evaluation; and the investment process of the Future Fund. These sections might be valued by readers with a deeper interest.

Individual papers are available on the Social Science Research Network (http://www.ssrn.com/en/), via the CIFR website (http://www.cifr.edu.au/), or through contacting the author on geoff.warren@cifr.edu.au.
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Primary Content</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Paper 1</strong>&lt;br&gt;Long-Term Investing: What Determines Investment Horizon</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>1. Introduction</td>
<td>General</td>
<td>6</td>
</tr>
<tr>
<td>2. What is Investment Horizon?</td>
<td>General</td>
<td>8</td>
</tr>
<tr>
<td>3. Why Does Investment Horizon Matter?</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>(i) Short-term and Long-Term Investment Portfolios</td>
<td>General</td>
<td>13</td>
</tr>
<tr>
<td>(ii) The ‘Problem’ of Short-Termism</td>
<td>Literature Review</td>
<td>14</td>
</tr>
<tr>
<td>(iii) Public Benefits of Long-Term Investing</td>
<td>Literature Review</td>
<td>18</td>
</tr>
<tr>
<td>(iv) Private Benefits of Long-Term Investing</td>
<td>Literature Review</td>
<td>18</td>
</tr>
<tr>
<td>4. Determinants of Investment Horizon</td>
<td>Literature Review</td>
<td>20</td>
</tr>
<tr>
<td><em>Influences related to investor circumstances:</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) Nature of funding or liabilities</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>(ii) Trade discretion and tolerance for illiquidity</td>
<td></td>
<td>23</td>
</tr>
<tr>
<td><em>Influences related to the design of the investing environment:</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iii) Organizational influences</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>(iv) Performance evaluation and remuneration practices</td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>(v) Financial market structures and financial liberation</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td><em>Influences related to investor choice:</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(vi) Investment philosophy and process</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>(vii) Information sets employed</td>
<td></td>
<td>29</td>
</tr>
<tr>
<td>(viii) Behavioural effects</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>(ix) Decision maker attributes</td>
<td></td>
<td>32</td>
</tr>
<tr>
<td><em>Other influences:</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(x) Cultural</td>
<td></td>
<td>32</td>
</tr>
<tr>
<td>(xi) Limits to arbitrage</td>
<td></td>
<td>33</td>
</tr>
<tr>
<td>(xii) Diversification via alternative assets (a push factor)</td>
<td></td>
<td>33</td>
</tr>
<tr>
<td>5. Conclusion</td>
<td>General</td>
<td>34</td>
</tr>
<tr>
<td>References for Paper 1</td>
<td></td>
<td>35</td>
</tr>
</tbody>
</table>

**Paper 2**

Benefits (and Pitfalls) of Long-Term Investing | | 41 |

1. Introduction | General | 42 |

Part A: General Concepts | | 44 |

2. Background | General | 45 |

3. Framework: Advantages and Strategies | General | 46 |
| (i) Three Advantages Held by Long-Term Investors | | 46 |
| (ii) Eight Strategies Suited to Long-Term Investors | | 49 |
| (iii) How the Future Fund Approaches Selected Strategies | | 52 |
TABLE OF CONTENTS (continued)

<table>
<thead>
<tr>
<th>Section</th>
<th>Primary Content</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Pitfalls of Long-Term Investing</td>
<td>General</td>
<td>53</td>
</tr>
<tr>
<td>(i) Potential Errors: Predicting the Distant Future is Hard!</td>
<td>”</td>
<td>53</td>
</tr>
<tr>
<td>(ii) Organizational, Agency and Alignment Issues</td>
<td>”</td>
<td>54</td>
</tr>
<tr>
<td>(iii) Constraints</td>
<td>”</td>
<td>55</td>
</tr>
<tr>
<td>5. General Conclusion</td>
<td>General</td>
<td>56</td>
</tr>
<tr>
<td>Part B: Detailed Focus on Two Strategies</td>
<td></td>
<td>57</td>
</tr>
<tr>
<td>6. Returns from Exposure to Illiquidity</td>
<td></td>
<td>58</td>
</tr>
<tr>
<td>(i) Illiquidity and Investment Horizon – Basic Concepts</td>
<td>Detailed Examination</td>
<td>58</td>
</tr>
<tr>
<td>(ii) Illiquidity, Asset Prices and Returns</td>
<td>Detailed Examination</td>
<td>60</td>
</tr>
<tr>
<td>(iii) Literature on Illiquidity and Asset Pricing</td>
<td>Literature Review</td>
<td>65</td>
</tr>
<tr>
<td>(iv) Discussion</td>
<td>General</td>
<td>69</td>
</tr>
<tr>
<td>7. Dynamic Strategies: Concepts and a Basic Model</td>
<td></td>
<td>71</td>
</tr>
<tr>
<td>(i) Conceptual Foundations</td>
<td>General</td>
<td>71</td>
</tr>
<tr>
<td>(ii) Basic Model</td>
<td>Detailed Examination</td>
<td>72</td>
</tr>
<tr>
<td>(iii) Summary</td>
<td>Detailed Examination</td>
<td>80</td>
</tr>
<tr>
<td>8. Dynamic Strategies: Practical Application</td>
<td></td>
<td>81</td>
</tr>
<tr>
<td>(i) Practical Issues</td>
<td>Detailed Examination</td>
<td>81</td>
</tr>
<tr>
<td>(ii) Application to Unlisted Property</td>
<td>Detailed Examination</td>
<td>82</td>
</tr>
<tr>
<td>References for Paper 2</td>
<td></td>
<td>89</td>
</tr>
</tbody>
</table>

**Paper 3**

**Designing an Investment Organization for Long-Term Investing**

1. Introduction                                                         | General         | 94   |
2. Determinants of Investment Horizon – A Reinterpretation                | General         | 96   |
| Commitment and Trade-offs in Long-Term Investing                        | ”               | 97   |
3. Ideas from the Literature                                             | Literature Review | 99   |
4. Building Investment Organizations with Longer Horizons                 | General         | 100  |
| (i) Orienting the Organization                                          | ”               | 101  |
| (ii) Setting the Right Incentives                                       | ”               | 108  |
| (iii) Establishing a Long-Term Approach                                 | ”               | 114  |
| (iv) Harbouring Discretion over Trading                                 | ”               | 116  |
5. Conclusion                                                            | General         | 118  |

**APPENDICES**

- Appendix A: Ideas from the Literature                                  | Literature Review | 119  |
- Appendix B: NPV-Based Performance Evaluation                           | Detailed Examination | 129  |
- Appendix C: The Future Fund Investment Process                         | Detailed Examination | 137  |
References for Paper 3                                                    |                 | 141  |
Long-Term Investing: What Determines Investment Horizon?

Dr Geoff Warren
Centre for International Finance and Regulation
Geoff.Warren@cifr.edu.au

OCTOBER 2014

Synopsis

The literature on investment horizon is reviewed in order to enhance the understanding of potential influences on long-term investing by institutional investors. Investment horizon reflects an inter-connected web of influences related to an investor’s circumstances, the design of the investing environment, and the choices that are made by key decision makers. Twelve such influences are identified and discussed. A characterization of investment horizon is offered based around two indicators: discretion over trading and how investment decisions are made, specifically the extent to which they are based on expected near-term price changes versus drivers of long-term value and returns. An overview of the debate over short-term versus long-term investing is also presented.

Acknowledgements: The author would like to thank in particular Stephen Gilmore, Will Hetherton and Nigel Wilkin-Smith, who formed the advisory team from the Future Fund for this project. Appreciation is also extended to Joe Cheung, David Gallagher, Jack Gray, Graham Harman, David Iverson, Damian Lillicrap and Neil Williams for their feedback and providing a sanity check.
1. Introduction

The appeal of long-term investing continues to garner attention. For example David Gonski, the recent Chairman of the Future Fund and Chancellor of UNSW Australia, has criticized the focus on the short-term, stating “we in Australia suffer in all sectors from a short-term perspective” and calling for greater attention on investing for the long-term.\(^1\) Further, the G20 and OECD include institutional investors and long-term investment within their recent agenda.\(^2\) We review and augment the literature on investment horizon, with the aim of enhancing understanding of the influences associated with long-term investing from the perspective of institutional investors. We consider literature arising from academic, industry and public policy circles, much of which is directed at the drivers and implications of ‘short-termism’ – the antithesis of long-term investing. This is the first in a series of three papers. The second paper (Warren, 2014b; ‘Paper 2’) investigates the benefits and pitfalls of long-term investing. The third paper (Warren, 2014c; ‘Paper 3) offers recommendations and suggestions for designing an investment organization so that it can successfully pursue long-term investing, drawing on the experience of the Future Fund.

Investment horizon arises from an inter-connected web of influences. We identify twelve influences under four broad groupings, as listed in the box appearing over. Some stem from the particular circumstances of the investor, including the sources of funding and their ‘stickiness’, the nature of any liabilities, and the associated discretion over trading and thus tolerance for illiquidity. In this respect, some investors naturally have a short-term orientation while others have greater latitude to pursue a long-term approach. Another set of influences relate to the design of the environment in which investment decisions are being made. Relevant aspects entail organizational features including governance; how performance is evaluated and rewarded; and the structure of financial markets. Investment horizon also reflects the choices made by those involved. Horizon is intimately related to investment philosophy and process, and the type of information that is paid attention to when making investment decisions. For instance, momentum investing tends to be short-term, while value investing is more typically longer-term in nature. Behavioural effects and even the personal tendencies of decision makers can also impact on how decisions are made and hence investment horizon. Other influences include culture and limits to arbitrage; while diversification towards alternative assets may be operating as a ‘push’ factor helping to lengthen horizons. Overall, investment horizon is partly a function of circumstances, partly a reflection of design, and partly the consequence of choice.

We re-consider how ‘long-term investing’ might be defined, or at least characterized. There is no definition of short-term versus long-term investing that is either commonly accepted or tidy. Indeed, no overarching theory of investment horizon seems to exist. A characterization of investment horizon is offered based around two indicators. The first is the extent of discretion over trading. Investors with longer horizons have latitude in deciding when they buy and sell; while investors without this discretion tend to be drawn towards a short-term view. The second indicator relates to how investment decisions are made, specifically the information used and whether it focuses on drivers of near-term price changes versus long-term value and returns. The latter is partly inspired by the distinction offered by Kay (2012) between ‘price discovery versus value discovery’, which is related to ‘trading versus investing’. Short-term investors are primarily interested in predicting price changes as these dominate payoffs over shorter horizons. They hence focus on aspects such as news flow and the actions of other investors. As the investment horizon lengthens, focus shifts away from price changes towards the drivers of longer-term returns, such as cash flow generation over time, future investment opportunities, and the implied long-term expected return given the price paid. In fact, cash flow generation and future investment opportunities are all that matter as the investment horizon extends to infinity. In summary, long-term investors are perhaps best characterized as those who set their sights on the generation of value and returns over the passage of time, backed by considerable discretion over when they trade.

\(^1\) See comments made at a Financial Services Council and Deloitte lunch in June 2013 at: http://www.afr.com/p/national/gonski_raps_short_term_investing_oPDPrcGMhQYQn2r1AgKH6dI

We also overview the debate on the relative incidence and efficacy of short-term versus long-term investing. There is a widely-held belief that short-termism is both pervasive and detrimental. Meanwhile long-term investing is considered comparatively rare yet virtuous. This standpoint is acknowledged by recounting the case against short-termism, as well as summarizing the purported benefits of long-term investing. However, the case against short-termism is not clear cut. Arguably the central question is one of balance, i.e. is there too much short-term investing? There seems enough evidence to support a case that the balance is tilted too far towards the short-term, with potential adverse implications for market efficiency, volatility, corporate myopia and the efficiency of financial intermediation. However, to the extent that the balance is indeed tipped too far, this will create opportunities for those capable of adopting a longer horizon. A brief overview is provided of these opportunities, with the intention of investigating this issue in more depth within the second paper of this series.

This paper is arranged as follows. Section 2 addresses the definition and characterization of investment horizon. Section 3 discusses why investment horizon matters, including an overview of the short-term versus long-term debate and purported benefits of long-term investing. Section 4 outlines the determinants of investment horizon as appearing in the literature. This section provides a foundation for the work presented in this series of papers. Section 5 concludes.

### Twelve Influences on Investment Horizon

**Influences related to investor circumstances:**

(i) Nature of funding or liabilities  
(ii) Trade discretion and tolerance for illiquidity

**Influences related to the design of the investing environment:**

(iii) Organizational structures  
(iv) Performance evaluation and remuneration practices  
(v) Financial market structures and financial liberation

**Influences related to investor choice:**

(vi) Investment philosophy and process  
(vii) Information sets employed  
(viii) Behavioural effects  
(ix) Decision maker attributes

**Other influences:**

(x) Cultural  
(xi) Limits to arbitrage  
(xii) Diversification via alterative assets (a push factor)
2. What is Investment Horizon?

A commonly accepted definition of long-term investing does not appear to exist. Listed below are different definitions of long-term investing or investors from the literature.

**Definitions of Long-Term Investing:**

- Marathon Club (2007) – long-term investing: “fundamental, research-oriented investment approach that assesses all risks to the business and which has a focused discipline of seeking positive returns over the long-term business cycle”
- Denison (2010) – long-term investor: “someone who is never obliged to sell because of prevailing market conditions”
- WEF (2011) – long-term investing: “investing with the expectation of holding an asset for an indefinite period of time by an investor with the capability to do so”, and ...
  ... long-term investors: “are less concerned about interim changes in asset prices, and instead are focused on long-term income growth and/or long-term capital appreciation both in their initial evaluation and continued interaction with their investments”.
- Papaioannou et al. (2013) – long-term investors: “those who have the intention of holding an asset for multiple years and are not expected to liquidate their positions in the short term”

None of these definitions is fully satisfactory. Each is too narrow to capture all relevant dimensions of long-term investing. Nonetheless they provide direction. The definitions variously focus on either investment approach, discretion to hold for the long-term, and/or intended holding period. We build on these notions below through proposing a characterization of investment horizon based around two indicators: discretion over trading and how investment decisions are made including the information used. But first we need to make a point about how actual holding period is an unreliable indicator of investment horizon.

Disentangling short-term from long-term investing is made less straightforward because capacity to trade can be validly used by long-term investors. Investment horizon would be exactly identified if all investors adopted a single, discrete holding period. That is, short-term and long-term investors might be clearly distinguished if all investors employed buy-and-hold strategies over well-defined periods of (say) a day, a month, a year, multiple years, decades, etc.; while giving no consideration for what happens in the interim or beyond the end of the holding period. However the world only occasionally operates in this way. Rare examples where horizon is well-defined include principal traders who religiously square their books at the end of each day (clearly short-term), and private equity funds where capital is committed for 10-years (clearly longer-term). In practice, many pools of money are earmarked to support expenditures that occur further down the track, but positions are reviewed and adjusted along the way. Gray (2006) points out that long-term investors are not naïve buy-and-hold investors, but must monitor their portfolios over time and occasionally take action.

The opportunity to trade muddies the waters considerably when aiming to prescribe an investment horizon. What is the investment horizon of a pension fund member who is due to retire in decades forth but who churns their investments? Further, it has been long-established in the academic literature that trading the portfolio may constitute optimal long-term behaviour under certain conditions, most notably where expected returns vary in predictable ways. The continuous time models appearing in the finance literature embed this possibility, with Robert Merton making the seminal contribution (e.g. Merton, 1971). Under these models, the concept of a discrete investment horizon is replaced by the assumption of an infinitely-lived investor whose portfolio is continuously updated under frictionless markets, after taking into account the immediate distribution of returns and how returns may evolve through time (i.e. changes in the ‘investment opportunity set’). Similar effects emerge under discrete-time models allowing for multiple periods (e.g. see Campbell and Viceira, 1999). Who is to say that an investor who continuously updates their portfolio in order to follow the optimal path is not a long-term investor? This is a manifestation of the notion of the ‘long-term as a series of short-terms’. With this in mind,

3 This characterization is closest to the definitions and related discussions presented by WEF (2011).
holding period can be ruled out as an unambiguous indicator of investment horizon, as implicit in the definitions of WEF (2011) and Papaioannou et al. (2013) for instance.

If the frequency by which portfolios are reviewed and adjusted is not a definitive guide to investment horizon, then what is? We propose two indicators as being more revealing. The first is the extent to which an investor has discretion over trading. This is a generalization on the reference in the definitions of Denison (2010) and WEF (2011) to capacity to hold an investment for the long-term. Some investors will have shorter-horizons because the nature of their funding or liabilities may require them to trade when they may not otherwise have done so. In contrast, bona fide long-term investors should never find themselves in the situation of needing to trade for any reason, and hence will have full discretion to maximize value over time. Nevertheless, merely having discretion over when to trade does not guarantee an investor will adopt a long-term horizon. They must also behave like a long-term investor. Hence a second indicator is required to capture this choice, which is broadly put as how investment decisions are made. Here we place emphasis on the information used in making decisions, rather than investment philosophy, process or style labels which are often imprecise. Short-term investors will adopt investment approaches that focus on information that assists in predicting near-term outcomes; while long-term investors will have their sights set on information relevant for future outcomes over an extended period. Before this concept is developed with some rigor below, it may be useful to present an illustration to provide some intuition. This is done in the box over, which describes how information used might characterize investment horizon in an equity market context.

Information Used by Short-Term vs. Long-Term Equity Market Investors

Information used by short-term equity market investors:
As returns over the short-term are dictated by immediate price changes, short-term equity market investors will be most concerned with anything that might drive share prices. This will lead them to focus on aspects such as news flows, how the next earnings announcement might compare with market consensus, the actions of other investors, market themes, and of course an evaluation of how share prices might react to such things. They are not necessarily unconcerned with the drivers of long-term value. However, they will filter their interest through the prism of what these long-term drivers might imply for immediate share price movements, i.e. how will the market react?

Information used by long-term equity market investors:
Long-term equity market investors will be more concerned with the ability of a company to generate cash flows and to build shareholder value over time. This is typically revealed by aspects such as business profitability, growth opportunities and management quality. The underlying belief is that not only does cash flow generation matter over the long run, but also that share prices will ultimately converge towards a value supported by these fundamentals. Long-term investors will also be interested in the price paid for this cash flow, as this determines the return that can be expected over the long-term. Aspects that are the focus of short-term investors such as earning revisions will not necessarily be ignored. However, they will be considered only to the extent that they shed light on a company’s long term potential, or perhaps because they may spark an over-reaction that provides an opportunity to buy or sell at attractive prices. Although long-term investors would probably tend to trade infrequently, as discussed previously this is not necessarily a distinguishing factor. Trading in reaction to market opportunities or changes in long-term expectations may be fully consistent with optimal long-term behaviour. What really distinguishes the long-term investor is that they set their sights on the long run drivers of value and returns, rather than near-term share price movements.

---

4 WEF (2011) refer in their discussion to long-term investing as being related to ‘attitude to investing’ and ‘intent’.

5 Investment philosophy, process and style labels can be an unreliable guide to investment horizon due to the wide variations in the manner by which approaches are applied in practice. For instance, ‘growth investing’ can be applied with either shorter or longer term focus, depending on how ‘growth’ is defined. Even ‘value investing’ may draw on shorter-term considerations when based around relative value concepts, which disrupt the nexus with long-term value. An extreme example is that some technology stocks were viewed as offering ‘value’ by commentators during the technology boom of 1997-2000 because their price/revenue ratio was lower than other (over-priced) comparables. Momentum investing is one of the few style labels that have a clear correspondence with investment horizon, being quintessentially short-term.
We present a simple diagram and a related general example to put some rigor around the concepts raised. Figure 1 depicts four types of investors. At the short-term extreme is Investor A, who only cares about the return over the next period—be it the next quarter, month, day, minute, whatever. The primary concern of Investor A is price changes, as this dominates return over a single, shorter period. At the long-term extreme is Investor D, a perpetual investor that buys and never sells. Investor D is only concerned with the cash flows that the investment generates, and how that cash is utilized (conditional on price paid). Future asset price is irrelevant to them as they never sell. In the middle sits Investor B and Investor C, both who intend to hold for some specific horizon longer than one period. Investor B is a buy-and-hold investor, while Investor C stands willing to trade. This induces a differing focus. Investor B is concerned only with his holding period return, which is a function of the end-period price, any cash flows generated over the holding period, and the return earned on reinvestment. Investor C is willing to trade, which should occur if they can predict variations in expected returns through time. Investor C is concerned not only with cash generation and its reinvestment, but also with the trading strategy that maximizes the outcome over the holding period.

Figure 1: Four Investors

<table>
<thead>
<tr>
<th>Horizon</th>
<th>Investor A</th>
<th>Investor B</th>
<th>Investor C</th>
<th>Investor D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approach</td>
<td>End of Next Period (Short)</td>
<td>Some Future End-Point (Medium-Long)</td>
<td>Some Future End-Point (Medium-Long)</td>
<td>Perpetual (Infinite)</td>
</tr>
<tr>
<td>Focus</td>
<td>Maximise Next Period’s Return</td>
<td>Buy-and-Hold, Then Liquidate</td>
<td>Willing to Trade Along the Way</td>
<td>Buy-and-Hold; Never Sell</td>
</tr>
<tr>
<td></td>
<td>Price Changes (Note: Cash generated secondary; reinvestment irrelevant)</td>
<td>Return Over Holding Period = End Price + Cash Generated + Reinvestment</td>
<td>Cash Generated + Reinvestment + Optimal Strategy</td>
<td>Cash Generated + Reinvestment</td>
</tr>
</tbody>
</table>

Figure 2 and Figure 3 aim to give a broad sense for how the comparative magnitudes of these components may vary with horizon. Figure 2 is compiled from the perspective of a buy-and-hold investor. It divides end-period (i.e. terminal) wealth over a range of holding periods extending out to 40 years into three components: (1) price at end of the holding period, (2) cash flows generated over the holding period, and (3) value generated from reinvestment of cash flows through the period. A return of 9% is assumed on both the asset and on

---

6 To keep things simple, the depiction focuses only on wealth generation and ignores consumption.

7 It is useful to consider that reinvestment may occur either through the investor reinvesting the distributed cash flow in another asset, or via retention and reinvestment of cash flows within the asset itself (e.g. earnings retention in the case of a company).

8 Our perspective broadly accords with the description of long-term investors provided by WEF (2011), but with added dimensions related to allowing for reinvestment and dynamic management.
reinvestment,\textsuperscript{9} which equates to a risk premium of around 5\% over current Australian 10-year bond yields. These assumptions are contrived, but their magnitude is unimportant to the overall message.

\textbf{Figure 2: Contributions to Terminal Wealth over Different Holding Periods}

For an investor with an investment horizon approaching zero (i.e. continuous time), 100\% of their expected return is determined by the end-period asset price. For a 1-year horizon, the end-period price still dominates, comprising 94\% of end-period wealth and hence expected return. The residual comprises the cash flow yield of 6\%. It hence should come as no surprise that investors with short horizons would spend most of their time focusing on price drivers. As horizon increases, the relevance of price declines while the importance of cash flows and reinvestment begin to increase. After about 11-12 years, terminal wealth comprises about 50\% end-period price, just over 30\% cash flow and just under 20\% from reinvestment. Further, this attribution understates the importance of cash flows to the extent that cash flow realizations dictate the path of prices over longer horizons. After 20 years, the weightings are 29\% end-period price, 30\% cash flow and 41\% reinvestment. The contribution from price eventually asymptotes towards zero, while the value generated from reinvesting cash flows becomes increasingly dominant.\textsuperscript{10} This simple analysis encapsulates the fundamental underpinnings of the message that as investment horizon increases, the investment approach and the information that it draws on should shift from price drivers towards value drivers, including cash flows and the use of cash flow. Further, there will also be a concern with the price paid for accessing future cash flows, and by implication long-term expected returns. Hence the key

\textsuperscript{9} The asset notionally pays out 100\% of free cash flow, with the distributed cash flow being reinvested in an alternative asset of equivalent risk that earns a comparable return. Reinvestment of cash flow in the asset itself was not incorporated into the analysis in order to keep it straightforward. If reinvestment were to occur, it might be seen as shifting the balance of future value towards cash flows generated by the asset itself and away from the value generated by reinvestment in an alternative. In the extreme situation of 100\% reinvestment, the two lines related to cash flow and the value of reinvestment might notionally be added together.

\textsuperscript{10} An implicit yet important point is the degree to which return upon reinvestment matters over longer horizons when cash flows are being reinvested in an asset. This provides a link to the notion that long-term investors should be concerned with agency considerations such as governance, management capability and alignment, as well as access to future growth options. What is done with the cash by the manager responsible for an asset matters quite a lot over the very long term.
Differentiator between short and long term investors is the extent to which there is a focus on different moving parts of the future value equation.

Figure 3 extends the example by presenting some illustrative calculations on dynamic strategies as a potential value driver for long-term investors. The calculations assume that the asset price/cash flow multiple fluctuates by ±15% around its mean value in a deterministic fashion over a four-year cycle. Our investor exploits these fluctuations by changing their position between 125% and 75% invested, with the balance made up by fixed income. Note that such price/cash flow fluctuations need not represent a persistent cycle of ‘mispricing’. They could also be consistent with justifiable fluctuations in the market-required or expected return of approximately ±1% under the parameters employed. The key assumption is that expected returns are predictable because mean reversion exists.

**Figure 3: Potential Value of a (Successful) Dynamic Strategy**

![Figure 3: Potential Value of a (Successful) Dynamic Strategy](image)

Figure 3 reveals the increase in end-period wealth and return per annum arising from the dynamic strategy for different holding periods, relative to the buy-and-hold baseline. While the assumptions are very stylized and will flatter the dynamic strategy due to their deterministic nature, they nevertheless serve to demonstrate the potential value to a long-term investor. For instance over a 20 year period, increases of 19% in wealth and 0.94% pa in returns are generated relative to buy-and-hold. This illustrates the point that trading can be valuable and need not be inconsistent with optimal long-term behaviour where there exists an ability to predict time-varying expected returns. A more rigorous examination of dynamic strategies in a long-term investing context appears in Paper 2.

The above discussion makes the point that investment horizon is not well-defined by holding period per se, but is perhaps best characterized by discretion over trading and how investment decisions are made in particular the information used. These insights provide some hints on designing an investment environment to help foster long-term investing.

---

11 The price/cash flow ratio is assumed to cycle as follows: start at the mean; rise to the mean+15%; return to the mean; fall to the mean-15%; and return to the mean, where the cycle recommences.

12 A 1-year interest rate of 3.5% is assumed on both investment and borrowing.

13 Marginal benefit is plotted from the end of the first 4-year cycle.
term investing. It firstly points towards a central role for the nature of funding and/or liabilities in determining the scope for an investor to adopt a long-term horizon, via the impact on discretion over trading. Basically, encouraging adoption of a longer investment horizon requires leaving an investor unconcerned with the possibility of being required to trade to satisfy funding obligations. Second, certain types of investment approaches and the information sources on which they draw are more consistent with long-term investing; specifically those that concentrate attention on long-term cash flow generation, future opportunities and estimation of long-term expected returns. Some hints on how institutional investors might be evaluated emerge as well. The tendency to judge performance on short-term returns seems entirely appropriate for short-term investors. But it may not be a fair measure of skill for long-term investors who base decisions on expectations for long-term cash flows and returns rather than near-term price changes. The latter might be better evaluated on their ability to project long-term cash flows and returns, while abstracting from the influence of short-term price fluctuations. We revisit all these issues in Paper 3.

3. Why Does Investment Horizon Matter?

In this section, we address the issue of why and how investment horizon matters. We commence by establishing that investors with differing horizons may have differing optimal portfolios. This is followed by an overview of the debate over short-termism and the relative efficacy of long-term investing. Contrary to widely-held beliefs, the implications and relative merits of short-term versus long-term investing remains an unresolved issue (also see Duruigbo, 2011). Indeed a case can be made that both short-term and long-term investing have a role to play, and that there is a need to cater for both (Atherton et al., 2007a; WEF, 2011). The main issues are whether there is too much short-termism, and whether this has created opportunities for long-term investors.

(i) Short-term and Long-Term Investment Portfolios

The notion that it is rational for investors with different horizons to hold different portfolios needs to be established at the outset. It is not being argued here that long-term investing is necessarily superior: a point that is emphasized in Paper 2. There is nothing in theory that suggests this must be the case. Indeed, both short-term and long-term investors should co-exist and behave differently given their circumstances, and this would be best outcome from both private and public policy perspectives. Two influences that may lead to optimal portfolios differing with investment horizon are outlined below: variation in risk and return with horizon, and the impact of transaction costs.14

The manner in which risk and return varies with investment horizon can matter in situations where investors plan towards discrete holding periods (see for instance Rehring, 2012).15 Campbell and Viceira (2005) raise the notion that risk and return have a ‘term structure’, which in turn can be a driving force for variation in the risk-return trade-off and hence optimal portfolios with horizon. A key determinant is the existence of momentum and/or mean reversion (also see Campbell et al., 1997). Momentum leads to increasing volatility with holding period, as good (bad) outcomes tend to be followed by further good (bad) outcomes. Conversely, mean reversion leads to decreasing volatility with holding period. To the extent that the evolution of market prices and expected returns is dominated by mean reversion over the longer-term16 versus momentum in the short-term, long-term investors might be more willing to take exposure to assets that seem risky over short horizons as well as favoring strategies

---

14 The discussion in this section assumes investment horizon and asset returns are exogenous, when it is possible they are determined endogenously and simultaneously. For instance, time-varying risk-return and the effects of transaction costs could in turn feedback into investment horizon that an investor decides to adopt. For example, Cheng et al. (2010) estimate the optimal holding period for unlisted real estate at about 5 years, given estimates for expected return, risk, transaction costs, time on market and investor risk aversion. To keep things simple, a partial equilibrium is assumed and the general equilibrium possibilities are overlooked.

15 The literature being discussed here ignores the possibility of trading before the end of the holding period.

16 Mean reversion provides one underpinning to the related and much-debated concept of ‘time diversification’ (see Kritzman, 1994; Thorley, 1995; Bennyhoff, 2009).
such as value investing and disciplined rebalancing. Variation in correlation structures between assets over time can further contribute to differences in optimal portfolios across time horizon (see Campbell and Viceira, 2005; Rehring, 2012). Kamara et al. (2013) provide evidence that various equity market factor exposures are priced over differing horizons, with value the longest at 2-3 years.

Cost of transacting is another dimension along which optimal portfolios may vary with horizon. This in turn is related to illiquidity, which is discussed further in Section 4(ii) and examined in detail in Paper 2. The simplest way to grasp the concept is to consider a fixed cost for establishing and then liquidating an investment. The longer an investment is held, the less that the transaction cost reduces net return as a consequence of deferral of the liquidation costs along with ‘amortization’ of transition costs over more periods (see Amihud and Mendelson, 1986). Consequently, investors with longer horizons than the average investor should have portfolios skewed towards assets that are costly to trade because they are relatively less impacted by these costs. The interaction between horizon, transaction costs and illiquidity may hence justifiably give rise to differing portfolios and associated clientele effects in asset ownership (Amihud and Mendelson, 1986).

The notion that portfolios should vary with investment horizon under certain conditions provides context for the debate over short-term versus long-term investing. Neither approach should be viewed as necessarily superior. Rather, they might be viewed as complimentary in a world where investor differences matter.17

(ii) The ‘Problem’ of Short-Termism

Much of the literature on investment horizon is directed at the ‘problem of short-termism’. We use this as a point of departure, before conveying what the literature says about the potential benefits of long-term investing. Three definitions of short-termism appear below. All focus on short horizon decision-making that has adverse consequences over the long-term. Hence discussion of short-termism is not necessarily criticizing short-term behaviour per se, but contains an inference of sub-optimal behaviour.

**Definitions of Short-Termism:**

- Laverty (1996): “decisions and outcomes that pursue a course of action that is best for the short-term but sub-optimal over the long run”
- Atherton et al. (2007a): “preference for actions in near-term without due consideration for long-term consequences”
- Kay (2012): “tendency to make decisions in search of immediate gratification at the expense of future returns: decisions we subsequently regret”

A belief that short-termism is rife and has detrimental effects is implicit in much of the commentary on investment horizon, e.g. see Bogle (2005); Kay (2012); Ambachtsheer (2014); Towers Watson (2014b). Nonetheless, the lines are often blurred between short-term behaviours that are justifiable and those that are detrimental. We outline the purported detrimental effects below. Counter-arguments that short-termism may not be the scourge generally believed are then relayed.

**Adverse Implications of Short-Termism – The Arguments**

(a) **Market inefficiency** – It is often claimed that short-term behaviour leads to market inefficiencies and mispricing, including asset price bubbles and panics. The following authors provide commentary along these lines:

- Froot et al. (1992) examine and model the situation where short-term prices may be dictated by beliefs about the behaviour of other investors, i.e. the Keynes ‘beauty contest’. Froot et al. argue that, under these conditions, short-term traders have an incentive to herd by co-coordinating their actions and trading on

---

17 This statement contains an implicit assumption that the ‘separation’ theorem does not hold in practice.
similar information. Further, this can result in spill-over effects where some relevant information is ignored and other irrelevant information is incorporated into prices. They note that similar effects occur under some models of price bubbles and noise trading plus positive feedback.

- Bushee (2001) presents empirical evidence that the focus on near-term earnings by ‘transitory’ institutional investors can lead to mispricing.

- Rappaport (2005) claims that short-term investors focus on information like earnings, relative value and technicals rather than long-term value and discounted cash flow analysis. He argues that this can lead to inefficiencies from both fundamental (i.e. price level) and resource allocation perspectives, even if the market is informationally efficient in the sense that investors cannot readily make excess returns.

- Atherton et al. (2007a) also mention that short-termism is associated with inefficiency, although do not expand on the point.

- Cremers and Pareek (2011) find a relation between the average duration over which stocks are held by institutions and various market anomalies, including those related to momentum, reversals and share issuance. This provides circumstantial evidence of a link between shorter horizons and possible mispricing.

- Both Croce et al. (2011) and Papaioannou et al. (2013) mention the notion that herding behaviour can help feed bubbles and procyclical behaviour.

(b) **Excess volatility** – The idea of a link between short-termism and excess volatility is an extension on the market inefficiency argument. It receives mention in Atherton et al. (2007a), Mercer (2010) and Papaioannou et al. (2013). Kay (2012) suggests short-termism can be associated with hyperactivity. Cremers and Pareek (2011) supply some evidence for this link in finding a relation between stock volatility and the duration over which a stock is held by institutions. Cella et al. (2013) provide further empirical support through examining the relation between fund ‘churn ratios’ (or turnover) and stock prices during three previous financial crises, specifically 1987, 1998 and the Global Financial Crisis (GFC). They find that funds with higher churn ratios were more likely to be sellers during these crises; and that the stocks they held were more likely to suffer larger declines which were subsequently reversed.

(c) **Procyclicality** – Papaioannou et al. (2013) state that it is well-documented that the financial system is procyclical, especially the banking sector. They further put forward that short-term, procyclical investing by institutional investors may help exacerbate the swings in the real economy via the influence on available funding. They present some evidence that institutions acted in a procyclical manner during the GFC; although most of their evidence is either anecdotal or only suggestive. Dang et al. (2014) find that stocks with greater ownership by institutional investor types likely to have shorter horizons were sold off to a larger extent during the GFC.

(d) **Induces corporate myopia** – One widely-made claim is that short-termism by investors induces myopia by company management, which in turn has an adverse impact on investment, creation of long-term value and thus economic growth (e.g. see Atherton et al., 2007a; Drew, 2009; Mercer, 2010; Kay, 2012; Barton and Wiseman, 2014). Some supporting evidence that investors prefer near-term cash flows is provided by Miles (1993), Black and Fraser (2002) and Davies et al. (2014). Atherton et al. (2007a) raise the notion that short-termism encourages growth through mergers and acquisitions rather than organic growth. They also mention that focusing on immediate returns can mean sustainability considerations are ignored. Aspen Institute (2009) argues that the focus on quarterly earnings harms long-term shareholder interests. Haldane (2010) contends that the reduced duration of CEO appointments may be a symptom of the linkage between short-termism and corporate myopia. A large body of academic research has examined the relation between investor investment horizon, effectiveness of corporate monitoring and evidence of myopic corporate actions. Many of these papers find that investors with longer horizons have a positive influence on corporate behaviour (e.g. Gaspar et al., 2005; Chen et al., 2007; Elyasiani and Jia, 2010; Attig et al., 2012), thus inferring a link
between investor horizon and effective corporate monitoring. Asker et al. (2013) uncover a lower propensity towards capital investment by public versus private companies, including evidence consistent with the notion that public listing helps to engender corporate myopia. Graham et al. (2005) survey corporate management. They find evidence of a willingness to sacrifice shareholder value over the longer term in order meet earnings estimates, in order to build ‘credibility with the market’ and support the share price.

(c) **Impediment to strengthening of corporate governance** – Related to the corporate myopia argument is the notion of a link between investor short-termism and corporate governance. This is raised by Atherton et al. (2007a), Aspen Institute (2009), Denison (2010) and Croce et al. (2011). Indeed the latter issues a charge that institutional shareholders have been ‘asleep at the wheel’. The underlying notion is that short-term investors are not interested in enhancing governance with the view to improving long-term returns. As noted by Kay (2012), short-term investors are more likely to exercise their right to ‘exit’ when a company underperforms, rather than exercising their ‘voice’ by advocating change.

(f) **Impacts the efficiency of financial intermediation** – A number of commentators suggest that short-termism disrupts the efficiency by which financial markets provide intermediation in a number of ways:

- Croce et al. (2011) and Papaioannou et al. (2013) identify short-term behaviour as exacerbating the funding difficulties for long-term investments like infrastructure.

- The higher trading costs associated with short-term investing receive wide attention, e.g. Aspen Institute (2009); Papaioannou et al. (2013). Ample evidence exists that turnovers are high and have increased markedly over time. Bogle (2005) estimates that US equity fund turnover increased from 25% in around 1950, to over 100% after 2000. Mercer (2010) found investment managers around the world had average turnover of 72% pa over the 2006-2009 period with over 20% having turnovers exceeding 100% pa. Croce et al. (2011) estimate that investment holding periods were around 1 year on most of the world’s exchanges in 2010, including around 5 months on the NYSE. While trading can have benefits as well as costs, there are some signs that an element of deadweight loss is involved. For instance, Edelen et al. (2013) provide evidence that high trading can impact negatively on mutual fund returns. Trading costs were also cited as an issue by managers covered in case studies reported in Mercer (2010).

- Costs associated with changing investments can also stem from turnover of managers held by institutional and other investors (Atherton et al., 2007a). A number of authors find that the switching activity of investors in pooled investment funds is costly. Estimates place the negative impact on fund returns at in excess of 1% pa (see Edelen, 1999; Coval and Stafford, 2007; Chen et al., 2010; Rakowski, 2011). In addition, Johnson (2004) points out that redemption by investors who leave a fund can impose costs on other long-term investors who remain invested. He estimates this wealth transfer between investor types at around 0.85% pa.

- Guo (2013) finds that institutional investors with shorter evaluation horizons within their compensation structure tend to hold higher risk portfolios.

- Mercer (2010) makes reference to the agency costs which arise from mis-alignments of horizon between end-investors and the institutions managing their money.

**Adverse Implications of Short-Termism – The Counter-Arguments**

Not all commentators agree that there exists pervasive and detrimental short-termism. Further, the actual evidence for damaging short-termism is not as strong and unambiguous as is often presumed. Outlined below are three counter-arguments to the claim that short-termism is a major issue.

---

18 These papers are discussed further in Section 4(i).

19 Guo (2013) finds no relation between horizon and returns.
(a) **Short-term behaviour can be difficult to distinguish** – Much of what is taken to be short-term behaviour need not necessarily be short-term in nature. In part, this chimes with comments we made earlier that the extent to which an investor trades is an unreliable indicator of investment horizon. Greenfield (2011) discusses the difficulty of clearly identifying when seemingly ‘short-term’ behaviour is ‘irrational’ over the long-term. He notes that ‘short-term’ information like earnings can also be relevant for long-term value. For instance, higher earnings could be the outcome of either earnings manipulation or successful strategy. Conversely, lower earnings could reflect either a failure of strategy or the short-term costs associated with long-term investing. Greenfield also makes the point raised earlier that a series of short-term strategies may be optimal in the long-term if done successfully and at lower cost or risk (i.e. long-term as a series of short-terms). Atherton et al. (2007a) conduct focus groups of industry participants. Two points to arise are that reactions to earnings announcements may be more rational than expected; and that some decisions which appear short-term may merely reflect the response to previously inadequate assessments of the future. Papaioannou et al. (2013) also acknowledge the difficulty in distinguishing temporary fluctuations from more fundamental changes. We extend on these points by making two additional observations. First, the idea that markets are overly focused on short-term earnings seems hard to square with evidence that the market appears to under-react to earnings news, as reflected in the well-known anomaly of post-announcement earnings drift (see Dechow et al., 2013 for a recent overview). Second, it is worth reiterating the difficulty of distinguishing ‘mispricing’ from rational changes in required returns under conditions of time-varying uncertainty or preferences. Prices may rise or fall because investors rationally require a different return, and this may not indicate mispricing brought about by the actions of short-term investors. For instance, who is to say that the price declines seen during the GFC were the result of irrational short-termism given the massive uncertainties at the time?

(b) **Short-term investor behaviour need not be detrimental** – The notion that short term investing is necessarily detrimental has also been questioned. WEF (2011) observe that short-term investors can rapidly re-allocate capital in response to changing information and economic conditions, can contribute to greater market liquidity, and can help to keep management accountable. A number of related points arise from the focus groups conducted by Atherton et al. (2007a). One is that a short-term focus is not necessarily a problem, to the extent that a degree of short-term action is needed for market liquidity and to resolve problems. Further, not all long-term decisions are necessarily good ones. Indeed, the core issue was seen as the quality of the decision making rather than short-term versus long-term. Yan and Zhang (2009) find that institutional investors with higher churn rates (turnover) make more informed trading decisions than those with lower churn rates. A range of papers find similar evidence that manager trading can be value-add (see Bennett et al., 2014 and articles cited therein). While this body of research examines only trading decisions and not overall portfolio performance, the findings nevertheless underline the idea that not all short-term activity need be bad.

(c) **The link between investor short-termism and corporate myopia is not clear cut** – While there is some evidence in support of such a link, it is by no mean compelling. Laverty (1996) examines arguments on the existence of short-termism, and points out there is: (1) no clear evidence of flawed short-term oriented management practices; (2) only mixed evidence that stock market myopia encourages corporate short-termism, noting for instance findings of positive stock market reactions to long-term investment by some papers; and, (3) an absence of empirical support for the supposed influence of ‘fluid capital’ on corporate behaviour. Results of a survey of company management by Marston and Craven (1998) also question the extent to which institutional investors are short-term in focus. While their survey uncovers a perception that sell-side (broking) analysts are focused on the short-term, company management did not consider this the case for buy-side analysts and fund managers. When asked if the buy-side was too concerned with short-term profit opportunities, only 21% agreed while 53% disagreed. Bailey and Godsall (2013) survey business leaders. They find that the greatest source of pressure to deliver short-term results (2-years or less) arises from internal sources such as the board, rather than investors.
In summary, finding clear evidence of pervasive and detrimental short-termism in financial markets is hampered by identification problems. This is a complex issue, and the evidence that does exist is mixed and by no means definitive. Nevertheless, there does seem to be some substance to the view that there is too much short-term behaviour in markets, and that this does have some adverse effects. Hence shifting the balance towards more long-term investing should be beneficial. We now briefly overview the public and private benefits of long-term investing as purported in the literature.

(iii) Public Benefits to Long-Term Investing

The literature points to three main public (i.e. social) benefits that arise from the operation of long-term investors in financial markets:

(a) **Stabilizing force in the market** (see Denison, 2010; Croce et al., 2011; WEF, 2011) – Long-term investors are more likely to ‘lean against the wind’ through investing in countercyclical manner, including their rebalancing activities. They can be buyers in times of weakness. Accordingly, they act as a buffer against financial panic and possibly unbridled speculation. In the latter case, the capacity of long-term investors to dampen speculation is more debatable. This requires being able to sell into a rising market, which can only be done if an asset is already held or could be sold short, coupled with a robust and disciplined investment process. These conditions may not be satisfied in all instances.

(b) **Engaged, responsible asset owners** (Croce et al., 2011; Urwin, 2011; WEF, 2011; see also Kay, 2012) – Long-term investors care about the value created by their investment through time. Hence they can be better monitors, more likely to encourage improved corporate governance, and more willing to consider longer-term risks when investing. This should assist in the efficient use of capital and hence wealth generation over time.

(c) **Financing long-term productive activity** (Croce et al., 2011; WEF 2011) – A common view is that long-term investors bring public benefits because they are more likely to provide finance for activities that add value in the long-run but where the short-term payoff is unclear, such as infrastructure or venture capital. The fact that they are less concerned with illiquidity risk assists in performing this function. We comment that a level of circumspection is required over this point, to the extent that not all long-term investments need be value-adding.

(iv) Private Benefits to Long-Term Investing

From the private benefit perspective, the key issues are the magnitude and nature of the opportunities faced by long-term investors, and how these opportunities might be captured. We address these issues in detail in Paper 2 and Paper 3. Here we present an overview of what the literature has to say on the private benefits.

Interestingly, various commentators emphasize differing features, albeit with some overlap. The purported private benefits fit into three groups: (1) return opportunities from aspects such as exploiting mispricings, accessing risk premiums especially those related to illiquidity, rewards from providing liquidity, and capturing long-term themes; (2) reduced costs from controlling leakages such as the costs associated with unnecessary turnover; and, (3) reduced risk through either better diversification via accessing a broader range of assets, or the influence of mean reversion on long-term returns (related to ‘time diversification’, see Kritzman, 1994; Thorley, 1995; Bennyhoff, 2009).

- Treynor (1976) proposes that opportunities for long-term investors will reside where market prices are set by short-term investors who make common mistakes (correlated errors). He suggests that any such mispricings

---

20 Evidence on the magnitude and consistency of illiquidity premiums is somewhat mixed: a notion alluded to by Ang (2013) and is discussed at length in Paper 2.
are more likely to occur with respect to “ideas that require reflection, judgment and special expertise for their evaluation and hence travel slowly”. This implies that long-term investors may do better in assets that are difficult to evaluate, and where value either unfolds or is recognized over the passage of time. Further, Treynor points out that it is not necessary for the market to correct pricing errors in order for long-term investors to make excess returns, as they can accrue greater returns through a higher yield by holding the asset. In other words, price re-adjustment is not needed to justify the position, but it would be a bonus.

- Ang and Kjaer (2011) point to three benefits to long-term investing: (1) ability to ride out market fluctuations; (2) profits from periods of elevated premiums or mispricing; and, (3) taking advantage of illiquidity premiums.

- WEF (2011) identify four benefits: (1) access to ‘structural’ risk premia, including the market risk premium, illiquidity premium and rewards for dealing with complexity; (2) avoiding short-term costs related to transacting, forced sales and behavioural errors (buying high, selling low); (3) taking advantage of secular themes or macro trends; and, (4) rewards from improving corporate decision-making through engagement.

- Jones (2012) suggests that countercyclical long-term investors are well-placed to capture premiums such as those associated with value, illiquidity and volatility. In part this is due to a tolerance for path-dependence. He states that long-term investors are “particularly well-suited to opportunistically absorbing risks that most other investors pay sizable premiums to avoid – for instance by engaging in counter-cyclical and market-stabilizing liquidity provision during crises, with a strong value bias”.

- Croce et al. (2011) note that long-term investors are well-placed to capture returns from illiquidity, both by providing liquidity and harvesting any illiquidity premiums. ASFA (2014) also refers to accruing an illiquidity premium.

- Gray (2006) points to three further benefits. The first two ‘slightly better predictability’ and ‘lower risk’, both seemingly reflecting a presumption of mean reversion. The third is lower costs as a result of lower turnover. Croce et al. (2011) also mention the benefit of lower turnover

- Longer investment horizons can accommodate the use of a wider range of assets including illiquid alternatives, which has potential to create more efficient portfolios (see Sa-Aadu et al., 2010; Cumming et al., 2014). Illiquid alternative assets, for instance, can be one way of diluting the heavy reliance on equity-related risks in most portfolios (see Leibowitz and Bova, 2007).

- Ambachtsheer et al. (2013) identify the leakages from the investment chain arising from adopting a short-term perspective, and then estimate the benefits from adopting a long-term approach. They suggest that the amount saved could be increased by 25% over a 20 year accumulation period through changes such as feasible reductions in turnover of assets and managers, engagement with companies to reduce unwarranted merger activity, and better-aligned incentive structures.

- It is worth adding that long-term investors are better able to access a range of other benefits associated with illiquid, unlisted assets. These include the scope to add economic value to assets directly (Kaiser, 2005); exploiting the information asymmetries that can occur in private markets;21 and taking advantage of disparate pricing across markets that are segmented due to illiquidity or other pricing frictions.

---

21 The requirement to trade only on ‘publically available information’ does not always apply in private markets.
4. Determinants of Investment Horizon

The determinants of investment horizon are now considered. Our aim is to provide a comprehensive overview of the potential influences on investment horizon as identified in the literature. A wide variety of influences are purported to be at play, with commentators emphasizing different aspects and no clear consensus on what are the major drivers. No over-arching theory on determination of investment horizon appears to exist. The closest to providing an integrated view is an empirical analysis by Cella et al. (2013), who relate the churn ratio (turnover) for US equity fund managers to various attributes. This work finds a significant relation between churn ratio and the responsiveness of assets under management to performance, investment style, certain organizational attributes and compensation arrangements. Reference is made to these findings as the discussion proceeds.

Twelve influences on investment horizon were listed in the box appearing on page 4. The list is repeated below, and provides a map for the discussion that follows. It is a long list, and there is much overlap. The influences form an inter-connected web, rather than acting as discrete elements. Order of listing should not be taken as a comment on relative importance.

Twelve Influences on Investment Horizon

Influences related to investor circumstances:
(i) Nature of funding or liabilities
(ii) Trade discretion and tolerance for illiquidity

Influences related to the design of the investing environment:
(iii) Organizational influences
(iv) Performance evaluation and remuneration practices
(v) Financial market structures and financial liberation

Influences related to investor choice:
(vi) Investment philosophy and process
(vii) Information sets employed
(viii) Behavioural effects
(ix) Decision maker attributes

Other influences:
(x) Cultural
(xi) Limits to arbitrage
(xii) Diversification via alternative assets (a push factor)

(i) Nature of Funding or Liabilities

A critical determinant of the scope for an investor to adopt a long-term horizon is the nature of either the funding source for the assets or any liabilities that the assets are intended to service. The nature of funding and liabilities is intimately linked to discretion over trading, including the possibility of being required to liquidate assets and henceforth tolerance for illiquidity. We discuss the latter in Section 4(ii), and in detail in Paper 2. Denison (2010) refers to the nature of funding or liabilities when he notes the importance of a 'supportive business model' for
long-term investing. The list below draws on and expands on Denison\textsuperscript{22} by identifying specific situations where funding considerations can hamper the potential to adopt a long-term investment horizon:

- **Open-ended fund structures**, where redemption-at-call means that in theory the manager could be required to liquidate at short notice;
- **Superannuation funds offering member investment choice**, which is conceptually equivalent to redemption-at-call notwithstanding the long-term nature of retirement savings;
- **Insurance companies that write short-tail business**, such as where assets are funding insurance liabilities involving claims that need be paid out within (say) a year;
- **Investments funded by short-term debt facilities**, where the line of credit may be withdrawn at short notice, such as some hedge funds;
- **Principal dealing desks**, where the funding capital may be withdrawn at the discretion of management;
- **Liquidity mismatches when hedging currency exposures**, where the sale of an illiquid overseas asset may be forced in order to raise cash in order to settle losses on the currency hedge.

The great bulk of funds managed by institutional investors are subject to some kind of funding risk. Notable exceptions include certain pooled vehicles like private equity and closed-end mutual funds. Defined benefit pension funds and long-tail insurance such as life products might be included in this group to the extent that they are servicing long duration liabilities. Even here, an ongoing focus on funding ratios or capital adequacy might induce a short horizon, even though the funding is secure or the liability is relatively predictable (Croce et al., 2011; WEF, 2011; Papaioannou et al., 2013; G30, 2013). Perhaps the main investor class that is under little direct pressure to adopt a shorter horizon as a consequence of funding or liability concerns are private investors managing their own money, providing they have no immediate spending obligations.

In most instances, withdrawal of funding is merely a possibility which occurs only occasionally. Most investment pools tend to be rolled over, and experience suggests that money tends to be ‘sticky’. It is rare for a large portion of funds under management to be withdrawn except in extreme circumstances. For instance, switching rates in Australian superannuation funds have been in a range of around 2%-5% (3.4% in 2012-3) with most switching related to change of employer, according to the Cooper Review (2010) and Roy Morgan Research. Nevertheless, the money is rarely guaranteed to stick, and substantial redemption episodes occur every now and then. For example, Ben-David et al. (2012) estimate that 9.5% out of the 12% that hedge funds sold of their equity holdings during the GFC were explained by funding shifts (6% redemptions, 3.5% unwinding of leverage). The sales that occurred would have been even larger if some hedge funds had not imposed gates on redemptions.

Regardless of the amount of redemptions that are actually observed, the notion that funding could be lost matters and can influence behaviour. One way to think about this issue is that expected returns are lowered by the probability of redemption multiplied by its expected cost. As discussed next, these costs might be quite high especially in the tails of the distribution of possibilities.

There is ample evidence that a significant negative impact on returns can arise from loss of funding. The academic literature has established that the provision of liquidity by mutual funds to investors through offering redemption-at-call can have a meaningfully negative impact on performance. Edelen (1999) estimates that liquidity trades made in response to fund flows to have reduced abnormal returns of US mutual funds by 1.5%-2.0% (relative to a 100% turnover baseline). Johnson (2004) estimates this cost at 1.12% pa. Indeed, Edelen observes that the cost of

\textsuperscript{22} Denison (2010) identifies a number of circumstances where the business model may not be supportive of long-term investing, including lack of control over redemptions, reliance on leverage, being subject to capital requirements, and the need to sell to crystallize carried interest in private investments.
liquidity-motivated trades can fully explain the underperformance of open-ended mutual funds versus the benchmark. Similarly, Coval and Stafford (2007) find that mutual fund “fire sales” to meet redemptions result in the stocks traded underperforming by nearly 15% followed by partial rebound over a 1-2 year period. Funds are estimated to end up selling at about 5% below ‘fair value’. Coval and Stafford further point out that these sales depress performance across all funds suffering redemptions. When coupled with the tendency for fund flows to respond to performance, this alerts to the potential for self-feeding spirals that generate ongoing losses. Chen et al. (2010) find evidence of such adverse performance-flow effects amongst US mutual funds, particularly for funds that are weighted towards illiquid investments. They question the suitability of open-ended structures where illiquid assets are involved. Rakowski (2011) reports a negative relation between volatility of fund flows and performance, supplying evidence that providing liquidity is especially costly when liquidity demands are volatile. An every-day example of the costs associated with becoming a forced seller are the losses incurred by property investors subject to foreclosure, who Campbell et al. (2011) estimate sold at a large average discount of 27% in Massachusetts over the period 1987-2009.

The notion that risk of funding loss may increase during market crises also needs to be figured into the calculations. The possibility arises of severe tail events, which while rare can have an extreme impact. The danger is that market weakness leads to reporting of poor returns, which in turn causes a loss of funding as investors attempt to redeem their investments or capital is withdrawn, thus forcing sale of assets into weak markets at below fundamental value. If these sales result in further price declines and loss of funding, a self-feeding downward spiral or ‘run’ may result. History throws up a number of events where a painful period of poor performance was suffered by funds in such a situation. Mitchell et al. (2007) describe such episodes with respect to merger arbitrage during 1987 and convertible arbitrage hedge funds during 2005; while Khandania and Lo (2011) discuss a comparable event for quant equity funds that evolved from August 2007. An Australian example is the painful unwinding of the open-ended unlisted property trust sector in the early 1990s, where the entire sector severely underperformed and was unable to satisfy redemptions following a property market collapse.23 Ang (2011) describes how the Harvard endowment fund – supposedly an archetypal long-term investor – suffered due to an unanticipated need to sell illiquid assets to meet cash flow needs during the GFC. A number of academic models of these processes exist, many of which have emerged after the GFC (e.g. Brunnermeier and Pedersen, 2008; Acharya et al., 2009).

Another consideration is whether a fund is facing net inflows or outflows. Funds in the happy position of receiving inflows are natural buyers. Direction of inflows can help ‘grease the wheels’ of portfolio management and rebalancing.24 Funds can feel a lot more comfortable that they will not be placed in the position of needing to sell into weak markets if they are confident that they will continue draw inflows. The role of funds inflows is discussed in the context of Australian superannuation funds by Cummings and Ellis (2014), who provide evidence that funds flows influence the weightings held in illiquid assets. ISA (2014) details a range of factors impacting on liquidity flows and management for superannuation funds, including aspects such as the demographics of fund membership, member switching behaviour, number of options offered and the application of prudential regulation.

---

23 MLC provides an account of this episode, see: 
24 AustralianSuper describes how net contributions of around $250 million per month support their ability to hold ‘long-term assets’ and assist in portfolio management, see: 
http://www.australiansuper.com/-/media/Files/FactSheets/Investment/Factsheet%20Investing%20Insights%20Asset%20Allocation%20unp e%202013.pdf; page1
A related driver is the horizon of fund investors, which in turn can transfer across to the horizons adopted by managers. Evidence is provided by Jin and Kogan (2007) and Cella et al. (2013), who find that investor short-termism as measured by sensitivity of fund flows to performance is related to the extent to which managers turn over their portfolios. The implication is that lower performance-flow sensitivity (i.e. investors who are less performance responsive) may permit fund managers to adopt a longer horizon. A large literature exists on the relation between fund flows and performance. This literature gives clues on the underlying drivers of this relation, and consequently how the flow-performance sensitivity might be dampened to help foster a longer investment horizon. One element is ‘participation costs’, which encapsulates the information and other costs involved accessing and switching between funds (see Lettau, 1997; Sirri and Tufano, 1998; Huang et al., 2007). Invested funds are more likely to be sticky if participation costs are high. This body of research also finds that investors are more likely to respond to performance data and marketing efforts in the absence of other information. Hence the extent to which fund investors react to short-term performance is influenced by not just the costs involved in identifying and switching funds, but also the extent to which they have access to other information that might help them to better understand their investment.

In summary, when funding is not committed, investment managers will always have the thought that the money could walk sitting at the back of their minds. This will engender a wariness of investing in illiquid assets with long-term payoffs, and encourage a focus on short-term performance to the extent that it dictates fund flows. The provision of immediate liquidity by funds may be a benefit for investors . . . but it comes at a potential cost.

(ii) Trade Discretion and Tolerance for Illiquidity

Tolerance for illiquidity often comes up as a key point of focus whenever investment horizon is discussed, e.g. see Ang and Kjaer (2011); Croce et al. (2011); Jones (2012). An overview of the theory and empirical evidence on the determinants of illiquidity is provided by Vayanos and Wang (2013). Our aim here is to sketch the nature of the link. The main message is that investors with full discretion over trading will have the greatest tolerance for illiquidity, and as a consequence have the more latitude to adopt a longer investment horizon if they so wish. Conversely, investors that either have no discretion or could lose that discretion need to be more concerned with liquidity -- the ability to trade promptly at a reasonable price -- and consequently will be guided towards a shorter investment horizon.

Discretion over trading is intimately related to the previous discussion on the nature of funding and liabilities. Investors that can be required to transact in order to satisfy an obligation such as meeting a liability or responding to redemptions can be placed in a position of losing the discretion over trading. They hence have both a need for liquidity and an exposure to illiquidity risk. Note that some investors may have discretion over trading yet concede it through choosing an investment strategy which requires transacting regularly, such as momentum investing or active trading. In these circumstances, the need for liquidity is an outcome of the choice of strategy, and the underlying driver of investment horizon resides in the reasons for that choice. It worth observing that holding cash affords discretion over trading, which is lost if that cash is invested – an issue that will arise in the other papers in this series.

Given that the nature of illiquidity and its links to investment horizon is discussed in Paper2, here we summarize the key concepts. Illiquidity relates to both the cost and ability to trade an asset.25 An illiquid asset typically costs more to trade. This cost manifests as wider bid-ask spreads, greater price impact in order to execute a trade, ‘haircuts’ to secure exit in private markets, and so on. Thus one effect of illiquidity is its impact on expected return, which is a function of the higher expected cost of a ‘round trip’ of buying then selling the asset. Illiquidity also has risk dimensions. First, the cost of trading illiquid assets varies through time. More importantly, the cost of exit usually increases during market weakness, which makes illiquidity a systematic risk. Second, in some situations

---

25 Illiquidity may not only arise from the nature of the assets, but also from the structures within which assets are being held. For example, certain hedge funds may invest in liquid assets but yet offer restricted liquidity for investors because redemption can be deferred either under the contract terms or because a gate is imposed.
it may be impossible to sell as there are no buyers and no market exists. A recent example was the inability to sell corporate debt during the GFC. Note that ‘observed’ gross returns on illiquid assets should be higher to the extent that the marginal investor requires compensation for: (1) the greater expected costs associated with illiquidity, notably including transaction costs; and, (2) the extent to which illiquidity risk is systematic and hence demands an additional risk premium. These concepts underpin the analysis of Acharya and Pedersen (2005) for instance, who examine illiquidity within a CAPM context.

The impact on a particular investor of the expected cost and risk associated with illiquidity is directly related to their discretion over trading, and henceforth feeds into investment horizon in the following manner. Investors that do not need to trade may hold an illiquid asset for a longer period, which in turn reduces the impact of transaction costs on the overall return earned. A longer holding period means that the exit cost gets deferred and trading costs ‘amortized’ over more periods (a notion raised by Amihud and Mendelson, 1986). At the extreme, an investor who holds an asset forever will never incur the cost of exit. In addition, an investor with discretion to trade can evaluate the trade-off between incurring the cost of trading now relative to deferring the purchase or sale. If the price premium needed to get set or the haircut required to exit are too steep, they can decide to wait. In contrast, investors without discretion have to accept the market price. They run the risk of being forced to sell at a deep discount to fundamental value during a market crisis. Finally, investors without discretion might find themselves in an extreme position where they need to sell but cannot, which may threaten their financial survival. Cummings and Ellis (2014) provide some evidence of these factors in operation within Australian superannuation funds. They find that weightings in illiquid assets for industry funds are related to indicators of liquidity requirements, including the magnitude of funds flows and the number of members approaching the drawdown phase.26

In summary, the extent to which an investor has discretion over trading directly influences their need for liquidity, and their latitude to adopt a longer investment horizon. It is one of the two key indicators proposed in this paper for characterizing investment horizon. Further, discretion over trading directly can stem from the nature of funding or liabilities. Both of these aspects relate to the specific circumstances of an investor, which is our first grouping of influences on investment horizon. The second grouping is now addressed, which relate to the design of the investing environment.

(iii) Organizational Influences

The manner in which organizations are configured can influence their scope to adopt a long-term approach. Irving (2009) for instance highlights the importance of governance and ownership structures; while others emphasize the nature of principal-agent relationships. These issues are discussed under two headings: alignment, and organizational structure.

Alignment

Long-term investing is far more likely to occur and prosper if there is alignment throughout the decision chain. That is, buy-in is required from everybody involved in the organization. Aspects that influence alignment include the principal-agent relationship, governance, and reward structures. Points made in the literature that are related to the first two aspects are discussed below. Reward structures are considered in Section 4(iv),

• Laverty (1996) puts a general case that organizational factors are a key contributor to short-termism, citing various influences that may induce organizations to take short-term decisions with detrimental longer-term effects. One aspect is organizational inertia and hence unwillingness to adapt towards the future, which can stem from group-think, escalating commitment and social structures within firms. Another is how multidivisional structures can combine with short-term measurement to encourage business units to focus on short-term outcomes. Laverty also cites managerial opportunism in pursuit of short-term results, building of reputation

26 Other significant factors were funds size and the extent of internal management capability.
and avoidance of risk. These propositions are tested by Laverty (2004) and Marginson and McAulay (2008) using surveys of company employees. Undervaluation of the long-term is found by Laverty to be significantly related to the presence of temporal trade-offs, organizational trust and organizational memory. Marginson and McAulay find short-termism to be associated with an individual’s role ambiguity and nature of their work group. Interestingly these aspects mattered more than performance measurement and incentives, or the influence of capital markets.

- A number of commentators discuss the nature of the principal-agent relationship as a key influence, e.g. Ambachtsheer et al. (2013). Ang and Kjaer (2011) point to the need for buy-in from both owners and managers in order to adopt long-term strategies and tolerate short-term losses, seeing misalignment as a source of missed opportunity (also see Ambachtsheer, 2014). Gray (2006) considers principal-agent frictions as a major driver of short-termism. Papaioannou et al. (2013) refer to principal-agent problems as a source of procyclicality and herding.

- Sitting at the base of the principal-agent problem is wariness by fund managers that they will not be rewarded for adopting a long-term horizon because investors provide mixed signals and only commit to employing them for the short-term. While this issue crosses over performance evaluation as discussed below, the root cause often relates to how investors engage with managers. Many commentators focus on the short duration of manager mandates in encouraging short-termism and acting as a barrier to long-term investing, e.g. Ambachtsheer and Bauer (2013), Ambachtsheer et al. (2013), Reid (2013). Managers involved in the case study conducted by Mercer (2010) cited mixed signals from clients about investment horizon, who are concerned about long-term performance yet adopt relatively short review periods. In a CFA poll of European institutional investors, 40% mentioned client preferences as a barrier to investing in long-term assets (CFA, 2013).

- Denison (2010) identifies a range of governance factors that inhibit the adoption of a long horizon. These include being too focused on short-term performance and peer comparisons, and a lack of organizational understanding of long horizon valuations and risk. An organization’s own tolerance for volatility (i.e. occasional losses) also matters.

- WEF (2011) raises a range of alignment factors that may influence the capacity of organizations for long-term investing, including: external pressures (e.g. political considerations in the case of sovereign wealth or public pension funds; perhaps trustee demands for endowment funds); organizational tolerance for losses; and the length of the decision chain from ownership to management (also mentioned by Kay, 2012).

- Kay (2012) suggests a link between decline of trust and short-termism. The notion is that because investors do not trust their agents, they keep them on a short leash by monitoring them closely and incentivizing via short-term performance.

Organizational Structure

Certain organizational structures are more likely to foster long-term investing than others. Cella et al. (2013) find considerable variation in churn ratios across fund types, with hedge funds and investment companies having churn ratios 2-3 times greater than pension funds, insurance companies and endowment and foundations. They also find that churn ratios are significantly lower when a founder is present within the fund’s management. Irving (2009) observes that family controlled businesses map onto many of the behavioural characteristics associated with a long-term perspective.

Organizational structures that are more likely to engender a long-term approach are those where funds are locked-in for an extended period under contractual terms. This guarantees the manager security of funding, and overcomes the issues around funding risk as discussed in Section 4(i). The use of such structures is in the minority, with the prime class being closed-end funds (see Cherkes, 2012 for a review). Stein (2005) discusses how closed-end structures allow managers to pursue long-term strategies. Cherkes, Sagi, and Stanton (2009) make the
specific point that closed-end funds package illiquid stocks into a more accessible and tradable security, allowing diversification into less liquid assets without facing the potential costs associated with direct trading, and without the externalities imposed by open-end fund structures. A related strand of the literature addresses how commitment can help investors overcome some of the behavioural problems that lead to short-termism, thus creating an environment under which a long-term perspective may be adopted. For instance see Laibson (1997), who discusses ‘golden egg’ investments where the payoffs are delayed and cannot be readily accessed in the interim. Closed-end funds might be considered a form of commitment mechanism.

If commitment mechanisms such as closed end funds allow fund managers to pursue a long-term approach, the issue arises as to why these structures are not more prevalent. Stein (2005) identifies the problem as one of agency risk. He suggests that the benefits of closed-end funds need to be traded-off against the risk of being stuck with a bad manager which cannot be disciplined. Stein hypothesizes this agency risk induces a preference for open-end funds, stemming from information asymmetry (and the desire of managers to signal themselves as skilled through utilizing open-ended structures). In essence, Stein is referring to a reluctance to give money to somebody else to manage without a mechanism to recall the funds if things are not working out.

The consumer choice philosophy underpinning regulatory and market structures may also be playing a role, at least in terms of its impact on the behaviour of managers (see ASFA, 2014; ISA, 2014). While pension money may act as a golden egg investment from the perspective of the member, the effect need not transfer to the manager when members have the capacity to immediately transfer funds. As we discussed in Section 4(i), the fact that the option to redeem exists can couple with concerns over its consequences to impact on manager behavior, even though the capacity to redeem may be used only occasionally. Atherton et al. (2007a) identify member investment choice as exacerbating the short-term performance pressures on Australian superannuation funds. Nevertheless, member investment choice has been embraced as a mechanism for disciplining fund managers. Over the years, APRA has encouraged fund comparisons in line with this philosophy; and the Cooper Review (2010) reinforced the role of “choice” and “helping members compare” as key planks. Australians are committed to investing in superannuation, but not committed to their manager. While the principles underpinning member investment choice are laudable in many respects, they can have the unintended consequence of helping to induce a shorting of manager investment horizons.

WEF (2011) also mentions that fund size may play a role, as larger funds may be better placed to access and evaluate complex, long-term investments due to their greater resources.

(iv) Performance Evaluation and Remuneration Practices

The manner in which performance is evaluated and rewarded is a flash point for many commentators. It seems obvious that investors will focus on delivering short-term performance if that is what they are rewarded for. Given this, the main interest is what aspects of performance evaluation and remuneration practices might encourage longer rather than shorter investment horizons. The literature offers the following points:

- A majority of commentators refer to the length of the evaluation period and the related term over which performance-based remuneration is earned as key drivers of investment horizon, with the consensus being that they are both too short, e.g. CFA (2006); Atherton et al. (2007a); Curran and Chapple (2010); Denison (2010); Croce et al. (2011); WEF, (2011, 2012); Ambachtsheer et al. (2013); FSB (2013); G30 (2013); Papaioannou et al. (2013); Reid (2013). ISA (2014) makes the point that short-term incentives induce a bias for action. In a poll of European institutional investors by the CFA Institute, 70% of respondents pointed to performance evaluation over short periods as a major barrier to investing in long-term assets (CFA, 2013). Cella et al. (2013) find that funds with a greater share of long-term remuneration had significantly lower churn ratios, providing some evidence that evaluation and compensation term matters.

- Another aspect purportedly encouraging short-term behaviour is the focus on relative performance, both versus market benchmarks and peers. Rappaport (2005) notes that managers operate “under the tight leash of short-

- WEF (2011) mention the focus on short-term risk measures, such as volatility.

- Papaioannou et al. (2013) mentions a role for asymmetric compensation structures involving greater rewards on the upside than penalties on downside. These authors seem to be referring to instances where bonuses are paid for outperformance above some hurdle thus creating option-like payoffs, such as for hedge funds and private equity.

- A related consideration is career risk. A manager is less likely to adopt a long-term horizon if they suspect they may not be around for long, or fear the consequences of short-term underperformance for their reputation, career prospects or even ongoing employment. For instance, Benartzi and Thaler (1995) allude to the tenures of fund managers as linked to myopic loss aversion (discussed in Section 4(viii)). In discussing drivers of short-termism, Gray (2006) emphasizes both business and career risk; Jones (2012) refers to reputational risk; and WEF (2011) as well as Papaioannou et al. (2013) mention career risk. Denison (2010) and WEF (2012) raise the role of the tenure of trustees as well as management. Cella et al. (2013) find that churn ratios increase when turnover of fund managers is higher. Chen and Pennacchi (2009) report a median manager tenure for US mutual funds of 6.0 years, with an inter-quartile range of 4.3-8.0 years. WEF (2011) discover an average tenure for chief investment officers of public pension funds of around 4 years in conducting their interviews.

- In terms of direct evidence on the term of compensation arrangements, data for equity fund managers point to an element of short-term bias but suggests that this is not pervasive. A survey by the CFA Institute found that 62% of buy-side portfolio managers and analysts have compensation that is based entirely on performance of 1 year or less (CFA, 2008). This implies that 38% have a component which extends beyond 1 year. More recently academics have begun to examine data emerging from the requirement since 2006 for US mutual funds to report their portfolio manager compensation structure. This data reveals a reasonably high degree of heterogeneity in remuneration arrangements, including some with a longer term basis. For instance, Ma et al. (2013) report an average evaluation period for US mutual fund managers of 3 years, with a wide range from 1-quarter to 10 years. Further, 25% have a vesting period in the 1-5 year range. Guo (2013) find that 43% have long-term evaluation components exceeding 1-year, with the median of the maximum evaluation periods within this sub-group being 4.1 years. On balance, the data seems to suggest that about 60% of managers are evaluated purely on short-term performance of 1-year or less, with the remainder having some medium-long term component.

(v) Financial Market Structures and Financial Liberation

Some commentators point to the structure and evolution of financial markets as having helped to foster short-termism. Focal points include the architecture under which delegated investment management occurs, and the role of financial liberation.

- Porter (1992) proposes a link between short-termism and ‘fluid capital’ systems such as typifies the US, which he contrasts with the ‘dedicated capital’ systems of countries like Japan and Germany. Porter sees fluid capital systems as characterized by transient and fragmented ownership of companies, with short-term holding periods focused on predicting share price movements rather than understanding the underlying business fundamentals. Vaughan (1992) makes an aligned observation about the contrasting governance systems in these countries.
A related argument refers to the *lengthening of the chain* between beneficial owners and those making the investment decisions. The argument is that this helps to foster a short-term culture, as delegated agents attempt to satisfy the expectations of investors who in turn are monitoring them based on the flow of short-term results (see for instance Atherton et al. 2007a; Croce et al., 2011; Curran and Chapple, 2011; WEF, 2011; Kay, 2012). This lengthening of the chain reflects the rise of intermediaries like institutional investors, consultants, fund-of-funds, external managers, and others. Internationalization has further distanced investors from their assets (i.e. companies they hold). Kay (2012) suggests that this chain creates misalignments such as a bias for action, as agents aim to justify their positions and sell their wares. Kay says the longer the chain, the greater is the potential for misalignment.

Another argument is that *decreasing transaction costs and increased liquidity* have made trading cheaper and easier, which in turn has encouraged shorter investment horizons (Haldane, 2010; Curran and Chapple, 2011). There is ample evidence that turnovers are high and have increased over time. Croce et al. (2011) notes how investment holding periods have declined markedly to around 1 year or less by 2010 on most of the world’s exchanges. Cella et al. (2013) document a median churn ratio of 25% per quarter for US institutional investors, i.e. portfolio turnover in excess of 100% pa. Nevertheless, this is a chick-and-egg issue: is greater trading and higher liquidity a determinant or outcome of shorter investment horizons? Some suggest they are drivers. Laibson (1997) argues that increased liquidity and more readily available credit have dulled the commitment mechanisms associated with investing in less illiquid assets. He even goes as far as suggesting this reduces savings and so economic welfare. Kay (2012) argues that because liquidity makes exit easier, it reduces incentives to undertake longer term actions such as engaging with companies.

Some commentators point toward changes in the nature of institutions operating in the financial markets. Atherton et al. (2007a) mentions the shift from defined benefit to defined contribution along with member investment choice as factors in increased short-term performance focus. WEF (2011) note the maturing of defined benefit as well as the shift to defined contribution as working against long-term investing. Others lay some blame on hedge funds and high frequency traders (HFT) for contributing to shorter horizons in the market (see Atherton et al., 2007a; Mercer, 2010).

Prudential regulations and reporting requirements are also noted as contributing to a short-term focus. One element is the extent to which liability-driven investors such as defined benefit pension funds and insurance companies are required to address funding deficits or capital adequacy on a period-by-period basis (Croce et al., 2011; FSB, 2013; Papaioannou et al., 2013). While it is debatable whether this is a good or bad thing overall, it can nevertheless have the effect of encouraging a myopic focus on asset-liability management rather than long-term wealth building. It engenders a preference for fixed income and reluctance to invest in certain long-term assets. Bushue (2001) discusses how fiduciary standards in the US contribute to a short-term focus, including the manner in which ‘prudence’ has been interpreted by the courts as based around ‘objective’ criteria such as reported earnings and common practice. In a poll of European institutional investors by the CFA Institute, 49% cited client regulatory requirements as a barrier to investing in long-term assets (CFA, 2013).

Taxation tends to be mentioned more as a possible solution to short-termism rather than a determinant of investment horizon (e.g. Atherton et al., 2007b; Aspen Institute, 2009). Nevertheless, aspects like differential short-term versus long-term capital gains tax rates may have an impact on the horizon adopted by an investor.

(vi) **Investment Philosophy and Processes**

We now address the third grouping of influences on investment horizon -- the choices made by decision-makers. One of the key choices is the approach to investing, i.e. investment philosophy and process. The link between investment approach and horizon is not always explicitly addressed, with WEF (2011) being a notable exception. Nevertheless, it is often implicit in the manner by which investment horizon is discussed. For instance, the definition of long-term investing offered by Marathon Club (2007) and the benefits of long-term investing
identified by Ang and Kjaer (2011) and Jones (2012) as discussed in Section 2 are laden with the presumption that certain investment approaches are inherently long-term. It is often claimed that momentum investing is quintessentially short-term in nature, e.g. see Gray (2006). Conversely value strategies are widely considered to be long-term. Woolley (2013) suggests the choice to use momentum rather than value is critical, and that momentum fosters a disregard for fundamentals and is the root cause of bubbles, crashes and excess volatility in general. Cella et al. (2013) find that value funds tend to have lower churn ratios than momentum (or growth-orientated) funds. Denison (2010) also suggests that a focus on long-term valuation factors is important for long-term investing.

The distinction made between momentum and value is correct as a general rule, although perhaps not strictly so.27 Value strategies rest upon longer investment horizons to the extent that they rely on mean reversion towards some intrinsic value, the timing of which may be protracted and is in effect open-ended. However, it would be disingenuous not to acknowledge that growth-oriented approaches may also be long-term in nature. Growth investing becomes long-term where it focuses on shareholder value generation through future investment opportunities and unanticipated growth.28 Some long-term investors such as Warren Buffett (Bolton, 2013) in effect follow a GARP or ‘Growth-At-a-Reasonable-Price’ rather than a classic value approach. In any event, investment approach labels are arguably not very helpful in establishing a clear link between investment approach and horizon, as they can be applied in a wide variety of ways (refer footnote 1 for a discussion). The fact that value and growth investing are often juxtaposed at opposite ends of the investment style range and yet both can be applied with a long-term focus signals the deficiency in investment approach as an indicator of horizon. The information set employed in implementing an approach is more revealing, and is examined next.

(vii) Information Sets Employed

We discussed in Section 2 how the type of information used can act as a key indicator of investment horizon. Our contention was that short-term investors are likely to have a primary focus on information that drives near-term price changes; while long-term investors will focus on information relevant for future value including cash flows, investment opportunities and longer-term expected returns. Below are relayed some of the comments in the literature related to this concept. One message is that the type of information that is made available may matter, as well as how that information is used.

- Kay (2012) differentiates between investors “whose primary focus is on the activities of the company – its business, its strategy, and its likely future earnings and cash flow – and those whose primary focus is on the market for the shares of the company – the flow of buy and sell orders, momentum in the share price, and short-term correlations between the prices of different stocks”. Another key distinction made by Kay is between those who ‘trade’ and those who ‘invest’. He also provides the insight that long-term investors worry not about ‘price discovery’ but ‘value discovery’, i.e. activities which yield insights into fundamental value. Bogle (2005) and WEF (2011) make similar comments.

- The manner in which earnings are reported and used is something of a flashpoint in the investment horizon debate. Much of this discussion is directed at the role of quarterly earnings, e.g. Rappaport (2005); CFA (2006); Atherton (2007a); Ambachtsheer and Bauer (2013). Rappaport (2005) suggests that it is easier to focus on near-term earnings than on long-term drivers, and that this becomes a self-fulfilling prophecy. Bushee (2001) finds evidence of a preference for short-term earnings amongst ‘transitory’ institutions. Nevertheless, it is suggested that how earnings information is used matters more than reporting frequency. Short-term investors are more likely to be concerned with how the next earnings release compares with market expectations. In contrast, long-term investors will focus on the information contained in earnings about future profitability.

27 The idea that value need not always be applied with a long-term perspective was discussed in footnote 5, with reference to the distinction between relative and absolute value. The Future Fund also argues that it may be valid for long-term investors to make use of momentum strategies in their portfolios: refer discussion in Paper 2.

28 Not all growth managers act in long-term manner, as some approaches labelled as ‘growth’ contain momentum elements. Cella et al. (2013) find growth funds to have relatively high churn ratios as a group.
Another concept is that short-term investors are more likely to focus on the immediate flow of market and economic news, rather than looking through near-term volatility and the cycle. A case study by Mercer (2010) found that most managers cited volatile markets and changing economic conditions as a contributor to higher turnover. While not definitive, this kind of response hints at a tendency for short-term reactions to the flow of macro news. Papaioannou et al. (2013) comment that traditional risk management systems do not look ‘through the cycle’. By contrast, a long-term investor will tend to sift through the noise to identify relevant information for persistent if not secular macro trends.

The nature of available information and its salience draws attention from some commentators. A related concept is that ‘what gets measured gets managed’. Atherton et al. (2007a) allude to these notions through commenting on the nature and content of financial reporting, where they point to a narrow focus on financial information and an insufficiency of information on long-term value drivers. Ambachtsheer et al. (2013) contend that belief in efficient markets has led to a strong emphasis on disclosure, and less emphasis on addressing market failure. The idea is that this encourages a high-frequency flow of information, to which investors then react. Atherton et al. (2007a) also point to the role of 24-hour news stations dedicated to financial markets. ISA (2014) refer to the frequent reporting of short-term performance as discouraging long-term investing in superannuation. Gray (2006) proffers a behavioural link with the quantity of information: “more information ... more confident ... more decisions ... and those decisions become increasingly short-term”. Ambachtsheer (2014) argues that the information age exacerbates the availability of information, and helps to encourage noise-driven activity. Some commentators propose that a short-term focus may be encouraged by the fact that the short-term may be considered more tangible and less uncertain than the long-term. For instance, Atherton et al. (2007a) suggest that short-term investing may be perceived as more informed because the long-term appears more uncertain and short-term information is likely to seen as more reliable. Laverty (1996) highlights information uncertainty associated with longer-term outcomes as playing a role in inducing short-termism, exacerbated by information asymmetry between owners and agents and the notion that short-term information may have more ‘impactedness’.

(viii) Behavioural Effects

The behavioural literature gives no definitive answer on the extent to which short-termism is a natural human state. Nevertheless, there are good reasons to suspect that behavioural effects do play some role in determining investment horizon. Appreciation for these behavioural effects can assist in understanding what may be preventing decision makers from adopting a longer horizon, and may help to design structures and communications in a way that fosters long-term investing.

Irving (2009) provides an excellent review of the behavioural effects behind shorter horizons. The points she makes are initially summarized, and then augmented with observations made by other commentators. Irving contends that a multi-disciplinary view is required to understand short-termism, observing that emotional and cognitive processes interact and that areas like biology and neuroeconomics can offer insights. Irving points to the following range of influences:

- **Biology**: A preference for immediate consumption may have emerged as a survival strategy. However, there is a case that this preference is not absolute, but can depend on environmental conditions.

- **Desire for immediate gratification**: This has been found to be stronger when rewards are more salient and had evident ‘hot’ qualities.

- **Presence of risk**: Risk appears to lead to less patient behaviour as a general rule.
• **Intertemporal choice:** In empirical settings, intertemporal choice seems better described by hyperbolic discounting in combination with myopic loss aversion (both discussed below), rather than discounted expected utility. These aspects are consistent with short-termism.

• **Framing:** Query theory hypothesizes that the order of presentation matters given the way memory processes operate. More patience may result if the reasons for pursuing immediate consumption are queried first (e.g. asking ‘why are you consuming now?’), rather than vice versa. Also, abstract rewards tend to be easier to delay than biological or emotional rewards. Irving points out that patience can be fostered by mental time travel, which entails emotional engagement through imagining some future reward.

• **Situations that weaken self-control:** Self-control, and hence the capacity to adopt a long-term view, may be weakened by stress or high decision load. Jones (2012) also refers how times of stress can result in ‘flight-or-fight’ responses in brain.

• **Neuroeconomics and the ‘two selves’:** Different areas of the brain appear activated for immediate versus delayed rewards, consistent with theories of two neural systems being at work. Thaler and Shefrin (1981) introduce the notion of two selves into an investment context, involving the ‘near-sighted doer’ and the ‘far-sighted planner’ both of who can be in conflict and undermine self-control. The two selves concept is also discussed by Haldane (2010).

Other commentators have raised other behavioural effects as making a contribution to short-termism:

• Laverty (1996) alludes to bounded rationality and use of heuristics, as well as cognitive biases in general. He emphasizes the interplay between time delay and discount rates on one hand, and risk or uncertainty on the other.

• Mercer (2010) and Croce et al. (2011) cite recency bias.

• Mercer (2010), WEF (2011) and Papaioannou et al. (2013) identify herding as an important aspect of short-term, procyclical behaviour. The latter provides a review of the herding literature.

• Kay (2012) cites optimism bias and anchoring as creating a bias towards action, as individuals react to imperfect information in the hope of making returns.

• Jones (2012) highlights the role of ‘group-think’ and consensus building on committees.

• ISA (2014) alludes to optimism bias, anchoring, narratives built around salient data in the presence of imperfect information, and the influence of ‘choice overload’, as well as bounded rationality.

We conclude this sub-section with a discussion of hyperbolic discounting and myopic loss aversion. These are two related and well-studied behavioural characteristics that are closely aligned with short-termism. As mentioned earlier, both have better empirical support than discounted expected utility in describing choice. Hyperbolic discount functions (see Laibson, 1997) are characterized by higher discount rates over short horizons relative to long horizons, which creates conflict between today’s preferences and those that will be held in future. The resulting time inconsistency can lead investors to put more weight on the near-term outcomes, relative to more distant prospects such as long-term themes. Myopic loss aversion (see Benartzi and Thaler, 1995) relates to prospect theory (Kahneman and Tversky, 1979), under which losses are feared to a much greater extent than gains are enjoyed. In combination with hyperbolic discounting, investors who are subject to loss aversion can become more concerned with immediate gains and fearful of near-term losses. The two effects combine to induce a focus on the short-term. The effects can be exacerbated where the chance of loss is greater over short periods versus when outcomes are aggregated over time, as can be the case when markets mean-revert.
A large experimental literature examines myopic loss aversion. This literature generates mixed findings on whether the effect primarily relates to the frequency of the ‘information feedback’ on outcomes, frequency of the opportunities for action (or ‘commitment’), or both (see for instance, Fellner and Sutter, 2009). Evidence exists that myopic loss aversion may be reduced by either shifting the focus of attention to the multi-period distribution (Benartzi and Thaler, 1999); making decisions in a team context (Sutter, 2007); or making people accountable and asking them to explain their decisions (Vieider, 2011; Pahlke et al., 2012).

(ix) Decision Maker Attributes

It seems intuitively obvious that the people employed by an organization may influence its capacity to adopt a long-term horizon. Gray (2006) quips “some people are temperamentally unsuited to long-term thinking”. WEF (2011) refer to belief in long-term investing, which they see as partly linked to employing the right people. WEF (2012) refers to the role of a professional, skilled board and talented well-staffed teams in fostering long-term investing, both of which should ideally remain stable with long tenures. Gray (2014) emphases the importance of personality type for successful institutional investing in general. Unfortunately there is little direct evidence on the extent to which the type of persons who are employed can influence the horizon of an investment organization.

Laverty (1996, 2004) and Marginson and Mcaulay (2008) hint at an individual dimension to short-termism by finding that the ambiguity faced by an individual in their role can help induce a shorter horizon. A number of commentators focus on the importance of leadership, for instance CFA (2006), Atherton et al. (2007c) and Marathon (2007). Consistent with this notion, Cella et al. (2013) find that churn ratios are significantly lower when a founder is present within the fund’s management – although this finding could also be explained by alignment as much as the personal attributes of owners.

(x) Cultural Influences

The final grouping of influences entails aspects that do not quite fit elsewhere. Some commentators claim that the culture of the markets or organizations can encourage short-termism. The pursuit of speculation rather than stewardship within financial markets is something of a focal point: see CFA (2006); Curran and Chapple (2010); Croce et al. (2011); Kay (2012). Mercer (2010) suggests a vicious cycle of asset volatility and short-term investing may be at play, fuelled by investor psychology and speculation. Further, short-term cultures can develop at the organizational level. For instance, Marginson and Mcaulay (2008) found an individual’s work group influenced their capacity to adopt a longer horizon. WEF (2011, 2012) consider institutional beliefs and culture to be important in fostering long-term investing.

Attention has also been directed towards the philosophies and beliefs that underpin regulatory regimes. Kay (2012) suggests that a US-inspired regulatory perspective based on equality of information (supported by belief in efficient markets) and the fostering of diversified financial institutions has encouraged a culture where transactions and trading are emphasized over relationships, and that this culture has permeated the financial industry. Woolley (2013) argues that belief in efficient markets provides an instruction manual for how practitioners invest (e.g. benchmarks) and policy-makers regulate (i.e. the market is correct), providing a fertile environment for short-term, momentum-driven behaviour.

Others see the preference for the short-term as an issue that extends well beyond just financial markets. Atherton et al. (2007a) mention the role of accepted behaviours and norms. They contend that aspects such as a materialistic society which demands immediate returns and satisfaction can drive short-termism, and that this manifests not only in investment markets but in “everything we do”. Short-termism is seen as the accepted way of doing things, and creates peer pressure to conform. Irving (2009) also highlights the possibility that national cultures may have an influence.
(xi) Limits to Arbitrage

The notion of limits to arbitrage is a broad one, and is typically used to explain why market anomalies may persist (for a review, see Gromb and Vayanos, 2010). Nevertheless, it is worthwhile relaying some of the basic concepts, as there are close ties between the literature on limits to arbitrage and the barriers to long-term investing. Shleifer and Vishny (1990, 1997) suggest that ‘arbitrageurs’ – which can be taken to mean any investor looking to exploit mispricing – will care about when the payoff occurs, i.e. how long it takes to converge back to fundamental value. This is because long-term arbitrage can be risky for three reinforcing reasons:

- **Fundamental risk** – This refers to the possibility of an adverse movement in underlying fundamentals before prices have had a chance to adjust. An example would be buying a stock that appears to offer value, then finding out it isn’t cheap as earnings are downgraded. This is essentially a form of information risk. Greenfield (2011) also discusses this issue.

- **Noise trader risk** – This refers to the possibility that uninformed investors could drive prices even further away from fundamental value.

- **Funding constraints under information asymmetry** – Arbitrage requires risky capital. But suppliers of capital, such as outside investors and lenders, don’t know for sure if an ‘entrepreneur’ (fund manager) is smart. This can lead them to restrict the funds that are made available, or even recall their funding if the market moves against the arbitrageur. This is a form of funding risk as discussed earlier.

These concepts are partly summed up by Keynes in the phrase: “markets can remain irrational longer than you can remain solvent”. The main implication is that many investors who aim to exploit mispricings may have difficulty in sustaining a position over the long haul. Shleifer and Vishny suggest that the speed of conversion to fair value depends on aspects such as how fast fundamental uncertainty can be resolved and investor misconceptions are corrected, as well as the effectiveness of arbitrage in driving prices to fundamental value. In cases where these mechanisms are weak or unreliable, arbitrageurs may optimally herd around short-term trades (also see Scharfstein and Stein, 1990); and mispricing of long-term assets need not be corrected. The implication is that many investors can be induced to adopt short-term horizons. This will especially be the case under situations of high and persistent uncertainty over fundamental value, and where arbitrageurs with uncertain skill levels are relying on external funding. Such conditions seem to apply across much of the investment industry. The notions raised link closely to the discussion of Treynor (1976), with the associated implication that long-term investors that are least impacted by limits to arbitrage may face the greatest opportunities.

(xii) Diversification via Alternative Assets (A Push Factor)

Desire to diversify is attracting investors towards alternative assets. And investing in alternatives demands a longer horizon. For instance, Jones (2012) makes the point that all alternatives entail exposure to illiquidity; while Laibson (1997) proposes that illiquid assets can act as a commitment mechanism. As a consequence, the trend towards alternatives may be acting as a push factor that helps to extend investment horizons at the margin. The OECD (2013) reports that weightings in alternative assets as at December 2012 stood at 15% for large pension funds and 12% for public pension fund reserves. A survey by Towers Watson (2014a) finds that exposure to alternatives has been trending higher over time, with the average pension fund weighting in ‘other assets’ (mainly alternatives) increasing from 5% in 1995 to 19% in 2012. Surveys of institutions point to the trend continuing, driven by influences such as diversification, pursuit of alpha and a shift towards absolute return benchmarks (see Cormier and Spencer, 2012; McKinsey, 2012; Cummings and Ellis, 2014). The allocations to alternatives include some short-term strategies like certain hedge funds, and are too modest to drive full dedication to a long-term
horizon in themselves. Nevertheless, a broadening of experience with longer-term, illiquid assets may help develop capacity for taking a longer term perspective within some institutions.29

5. Conclusion

We have reviewed the literature on investment horizon, particularly as it relates to institutional investors. While no over-arching theory on what determines horizon is uncovered, a wide range of inter-connected influences can be identified. Investment horizon seems to emerge partly as a function of circumstances, partly as a consequence of how the investing environment is designed, and partly as a result of choice by those making the decisions. An understanding of these influences provides the foundation for Paper 3 in this series, which puts forward recommendations and suggestions for how an investment organization might be designed to successfully pursue long-term investing. In addition, we have offered a characterization of long-term investing based on: (1) discretion over trading, and (2) how investment decisions are made, specifically the extent to which an investor focuses on the drivers of future cash flows, investment opportunities and long-term returns, rather than near-term price changes. This characterization also generates insights that help guide the ideas presented in both Paper 2 and Paper 3. Finally, we have overviewed the debate on short-term versus short-term investing, and summarized the benefits of long-term investing as purported in the literature. The latter provides background to Paper 2, which considers the benefits (and pitfalls) in more depth.

29 One factor capping the shift to alternatives is their higher fee structure, particularly where a balanced fund is sold at a specified fee that is then shared with the underlying managers. The extent that alternatives utilize large portions of any fee budget may make fund providers reluctant to allocate large weightings.
References for Paper 1


CFA (2006) “Breaking the Short-Term Cycle”, CFA Institute and Institute for Corporate Ethics


CFA (2013) “Long-Term Financing: Investor Perspectives in Europe”, CFA Institute, September


Hewitt (2004), “Investing Pension Funds As If the Long Term Really Mattered: Ideas from the Universities Superannuation Scheme and Hewitt Bacon & Woodrow Competition”, Hewitt Bacon & Woodrow, January


Laverty, Kevin J. (2004), “Managerial Myopia or Systemic Short-Termism? The Importance of Managerial Systems in Valuing the Long Term”, *Management Decision*, 42(8), 949-962


Mercer (2010), “Investment Horizons: Do Managers Do What They Say?”, *Mercer and IRRC Institute*


Benefits (and Pitfalls) of Long-Term Investing

Dr Geoff Warren
Centre for International Finance and Regulation
Geoff.Warren@cifr.edu.au

OCTOBER 2014

Synopsis

This paper outlines the benefits of long-term investing, as well as the pitfalls. Three key advantages held by long-term investors include: the capacity to adopt positions where payoff timing is uncertain; the ability to exploit opportunities generated by the actions of short-term investors; and latitude to invest in unlisted and/or illiquid assets. These advantages provide access to a broader investment opportunity set than available to short-term investors. Strategies suited to long-term investors include: capture of risk premiums arising from the actions of short-term investors; returns from liquidity provision; value investing; exploiting pricing discrepancies across segmented markets; long-term thematic investing; adding economic value to assets through engagement and control; investing in complex assets; and certain types of dynamic strategies. Pitfalls of long-term investing relate to their reliance on expectations about the long-term, when the distant future can be hard to predict; and vulnerabilities related to organizational, agency and alignment issues. Investing in illiquid assets and dynamic strategies are examined in detail.

The contents of this paper reflect the views of the author, and do not represent the official views or policies of either the Future Fund or the Centre for International Finance and Regulation or any of its Consortium members. Information may be incomplete and should not be relied upon without seeking prior professional advice. Both the Future Fund and the Centre for International Finance and Regulation and its Consortium members exclude all liability arising directly or indirectly from use or reliance on the information contained in this publication.

Acknowledgements: The author would like to thank, in particular, Stephen Gilmore, Will Hetherton and Nigel Wilkin-Smith, who formed the advisory team from the Future Fund for this project. The following are also thanked for their helpful input: Raphael Arndt, Barry Bracey, Paul Brunker, Joe Cheung, Matthew Donzow, Doug Foster, Tim Gapes, David Gallagher, Jack Gray, Brad Holzberger, Graham Harman, Anthony Lane, Damian Lillierap, David Neal, Rob Pereira, Kar Mei Tang and Rob Trevor.

Copyright © 2014
All rights reserved. Working papers are in draft form and are distributed for purposes of comment and discussion only, and may not be reproduced without the permission of the copyright holder.
1. Introduction

We consider the benefits and pitfalls of long-term investing. We highlight how long-term investors have access to a broader range of investment strategies, many of which stem from opportunities related to the actions or aversions of the shorter-term investors which can dominate markets. This makes long-term investing worth pursuing, at least for those who have scope to do so. We also warn that long-term investing holds no guarantee of success. A long-term investor still needs to implement well; and there are various pitfalls to avoid. How to design an investment organization to successfully pursue long-term investing is the topic of the next paper.

This paper comprises two parts. Part A addresses the general concepts: those who want to draw out the main messages may want to focus on these sections. Advantages held by long-term investors when operating in asset markets are identified, and linked to a range of investment strategies suited to those with long horizons. The pitfalls of long-term investing are also discussed. Part B examines two of these strategies in detail: returns from exposure to illiquidity, and dynamic strategies aimed at improving investment outcomes over the long haul. This is the second paper in a series on long-term investing by institutional investors. The first paper (Warren, 2014a; ‘Paper 1’) examines the nature and determinants of investment horizon, as well as the debate on short-termism versus long-term investing. The third paper (Warren, 2014c; ‘Paper 3’) puts forward our recommendations and suggestions for designing investment organizations with a long-term approach, drawing on the experience of the Future Fund.

In Paper 1, we propose two characteristics of a long-term investment horizon: discretion over trading; and an investment approach that focuses on long-term value and returns, as opposed to near-term price changes. We build on these notions in identifying three advantages held by long-term investors. The first advantage is the capacity to adopt positions where payoff timing is uncertain. This advantage directly flows from the ability to hold positions through difficult times as a consequence of having discretion over trading; and is abetted by a focus on long-term value or returns when identifying opportunities. The second advantage is the ability to exploit opportunities generated by the actions of short-term investors. Such opportunities can arise as a consequence of short-term investors either being required to trade or being short-sighted in their evaluations, thus leading to assets becoming either mispriced or offering unusually high (or low) long-term expected returns. In some circumstances, this may be mutually beneficial, given the diffuse motives and incentive structures of different investors. The third advantage is the latitude to invest in unlisted and/or illiquid assets, which widens the range of accessible investments. This advantage reflects the nature of unlisted and illiquid assets, investment in which typically requires discretion over trading and a long-term approach.

A key benefit of long-term investing is that it offers access to a broader opportunity set. Long-term investors can, in theory, attempt to implement any strategies available to short-term investors, plus some. Eight investment strategies are identified that are most suitable for long-term investors, allowing them to exploit their advantages. These strategies are briefly detailed in in Section 3 (see Figure 1). Two strategies - risk premium capture and liquidity provision - rely on exploiting opportunities generated by short-term investors. We list a range of premiums associated with risks to which short-term investors may be averse, including short-term market fluctuations (market risk premium, volatility premium), illiquidity, commodity price risk, insurance exposures and the risk of underperforming a benchmark or peers. Other strategies are suitable to long-term investors largely because of payoff timing uncertainty, or because they involve illiquid assets. These include: value investing; exploiting pricing discrepancies across segmented markets; long-term thematic investing; adding economic value through engagement and control; and investing in complex assets. Long-term investors are also suited to dynamic strategies which recognize that expected returns can fluctuate, thus creating opportunities to lower risk and/or enhance returns earned over the passage of time.

We also address the pitfalls of long-term investing. Long-term investing is no guarantee of success: a long-term investor must still implement well. Perhaps the gravest danger relates to errors in forming long-term expectations, in particular mis-estimating long-term value or expected returns. Long-term investments typically involve a high level of commitment due to their long duration and sometimes illiquid nature. Getting expectations wrong may
lead to being lodged in an underperforming asset for an extended period before the error is discovered, after which unwinding the position may prove tortuous and costly. The task is made all the more difficult because long-term prediction is hard, given the potential for regime shifts and the proliferation of possible outcomes over an extended time horizon. Feedback mechanisms can be hazy, as any misconceptions about the long term may take time to become apparent. Further, long-term investors face a number of points of vulnerability that are rooted in organizational, agency and behavioural influences. While long-term investments may attract broad support at the outset, commitment to positions can be sorely tested on many levels if success does not become evident within a certain period of time. Long-term investing programs can also be hampered by issues of alignment with employees or external managers who may be operating on shorter horizons.

Having established the general concepts, Part B then drills down into two areas of particular interest: illiquidity, and dynamic strategies. While access to the illiquidity premium is typically considered a major benefit of long-term investing, it is often interpreted simplistically. The central issue is the extent to which illiquid assets are priced to compensate for the expected additional costs, risks and constraints associated with illiquidity. These include higher transaction costs, the additional cost of sourcing and maintaining investments, the risk of being required to sell at unattractive prices at the wrong time, and the possibility of ending up with a sub-optimal portfolio due to failure to trade. Long-term investors may extract additional returns where they are less impacted by these costs and risks than the marginal investor. As the marginal investor can vary across markets and through time, the illiquidity premium is neither consistent nor ubiquitous. At times there may be no meaningful illiquidity premium. It is dangerous to assume that a premium must be available just because an asset is illiquid. The message is that illiquid assets need to be considered in the context of the long-term value or expected returns on offer. Further, the time-varying nature of pricing for illiquid assets suggests they may be suitable targets for a dynamic approach.

The type of dynamic strategy we examine entails buying when asset prices are low and expected returns are high; and selling when prices are high and expected returns are low. Such strategies seek out mean reversion, and are closely aligned with value investing. Often opportunities will arise from the actions of short-term investors who are required to trade, notably in less liquid markets. We initially present a basic two-period model that outlines the nature of such strategies, and how they may enhance the risk/return trade-off for long-term investors at the expense of short-term investors. We then address their practical application, which is illustrated using data for Australian unlisted property. We establish that there are two potential strategies. One involves committing to an asset with the willingness to sell if prices move too high. The other entails withholding investment with an intention to buy if prices move too low, e.g. retaining cash as an option on future opportunities. Our analysis suggests that a mix of both can be optimal in many circumstances, implying being partially invested and holding some cash in reserve. A caveat is that there must be a sufficiently high probability of a meaningful price decline within a reasonable time to justify holding cash. We also demonstrate that dynamic strategies are not just return-seeking, but can reduce risk over the long term; and how they may result in extended periods of underperformance before paying off. The latter attribute makes them mainly suitable for long-term investors.

This paper is arranged as follows. Part A covers the key concepts over four sections. Section 2 provides background, including a brief recap of the literature on the benefits of long-term investing, as covered in Paper 1. Section 3 discusses the three advantages held by long-term investors, and identifies the eight investment strategies that they are well suited to pursue. Section 4 addresses the pitfalls of long-term investing. Section 5 provides a general conclusion. Part B singles out two areas for examination in depth. Section 6 considers the returns from exposure to illiquid assets. The final two sections investigate dynamic strategies. Section 7 presents the underlying concepts and a basic model. Section 8 addresses their practical application - discussing implementation issues, and illustrating a dynamic strategy using property market data.
Paper 1 - Part A

General Concepts
2. Background

Paper 1 provided an overview of the private and public benefits of long-term investing as purported in the literature. Our prime focus in this paper is the private benefits that might accrue to institutional investors in particular. The range of benefits identified in the literature is recapped below, listed under three headings: return opportunities, lower costs and reduced risk. The list provides the backdrop for Section 3, where we establish a framework for identifying the benefits of long-term investing.

(a) Return opportunities – The literature highlights various return opportunities that are well suited to long-term investors, including:

- **Exploiting mispricings:** This concept is closely related to value investing. It partly derives from the idea that some combination of short-termism, information uncertainty and limits to arbitrage can lead to prices deviating from fundamental value, which might be exploited by investors with longer horizons, see Treynor (1976), Ang and Kjær (2011), WEF (2011).

- **Accessing risk premiums:** By far the major focus of most commentators is the illiquidity premium, e.g. Ang and Kjær (2011); WEF (2011); ASFA (2014). Section 6 of this paper provides a critical review of the illiquidity premium. Other risk premiums mentioned as suited to investors with longer horizons include: the rewards of dealing with complexity (Treynor, 1976; WEF, 2011); the volatility premium (Jones, 2012; Warren, 2012); and the market risk premium in general (WEF 2011).

- **Rewards from providing liquidity:** Croce et al. (2011) point out that illiquidity in markets holds out not only the prospect of illiquidity premiums, but also implies opportunities for making returns by providing liquidity when it is needed and valued.

- **Capturing long-term themes:** WEF (2011) suggests that long-term investors are well placed to take advantage of secular themes or macro trends.

- **Value-add opportunities:** The notion that long-term investors can benefit from helping to improve corporate decision-making through engagement is implicit in a wide-ranging literature discussing the link between investor horizon and effective monitoring (e.g. Kay, 2012). It is identified explicitly by WEF (2011). Illiquid, unlisted assets also present a range of opportunities to add value that may not be present in listed markets, including scope to add economic value to assets directly (Kaiser, 2005); exploiting the information asymmetries; and taking advantage of disparate pricing across markets that are segmented due to illiquidity or other pricing frictions.

(b) **Lower costs** – Long-term investing can lower costs by controlling leakages that arise from aspects such as unnecessary turnover; forced sales; behavioural errors (e.g. buying high, and selling low); and misalignment between managers and end-investors (see Gray, 2006; Croce et al., 2011; WEF, 2011). Ambachtsheer et al. (2013) identify the leakages from the investment chain arising from adopting a short-term perspective, and then estimate the benefits from adopting a long-term approach. They suggest that terminal savings might increase by 25% over a 20-year accumulation period through changes such as feasible reductions in turnover of assets and managers, engagement with companies to reduce unwarranted merger activity, and better-aligned incentive structures.

(c) **Reduced risk** – Two ways are suggested by which long-term investing may reduce risk:

- **Better diversification:** It is often claimed that long-term investors are better able to diversify, via a greater capacity to access a broader range of assets, including illiquid alternatives, and hence potentially create more efficient portfolios (see Sa-Aadu et al., 2010; Cumming et al., 2014). Illiquid alternative assets

---

30 The requirement to trade only on ‘publicly available information’ does not always apply in unlisted markets.
are often viewed as a path to diluting the heavy exposure to equity-related risks contained in most portfolios (see Leibowitz and Bova, 2007). However, this benefit is sometimes overstated.\footnote{31}

- **Risk is lower from a long-term perspective:** Some commentators allude to the idea that risk seems lower when viewed over longer horizons, e.g. Gray (2006). This perception is sometimes tied to 'time diversification' (see Kritzman, 1994; Thorley, 1995; Bennyhoff, 2009). However, in essence, it ultimately boils down to the influence of mean reversion, under which the annualized volatility of wealth reduces with horizon.

One issue with the benefits of long-term investing as identified in the literature is that they are often expressed as a grab-bag of notions or ideas, without any underpinning theory or conceptual basis. Treynor (1976) is a notable exception. Treynor’s starting point is to specify the advantages held by long-term investors, and identify conditions under which long-term investing is likely to be successful. In Section 3, we draw and build on Treynor’s tradition by presenting a general framework.

### 3. General Framework: Advantages and Strategies

We place the benefits of long-term investing within a framework in two stages. In Section 3(i), we identify three advantages held by investors with longer investment horizons, linking them to the discussion in Paper 1. Then in Section 3(ii), we relate these advantages to eight investment strategies. An account of how the Future Fund approaches selected strategies appears in Section 3(iii).

#### (i) Three Advantages Held by Long-Term Investors

Three key advantages held by long-term investors are:

- **a)** Capacity to adopt and hold positions where payoff timing is uncertain;
- **b)** Ability to exploit opportunities generated by short-term investors; and,
- **c)** Latitude to invest in unlisted and/or illiquid assets.

These three advantages\footnote{32} directly stem from the two key indicators used to characterize investment horizon as proposed in Paper 1. Recapping, the first indicator is the extent of discretion over trading, i.e. the latitude that an investor has in deciding when they buy and sell. The second is related to investment approach or the manner in which investment decisions are made - specifically the information used and whether it focuses on drivers of long-term value and returns, as opposed to near-term price changes. The three advantages proposed comprise a workable list that spans most of the benefits of being a long-term investor. The advantages as listed are not necessarily comprehensive or distinct. Indeed, they might be considered mutually reinforcing, such that the greatest opportunities should exist when all three advantages are evident.

\footnote{31 The diversifying benefits of illiquid assets can appear greater than they are for two reasons. First, covariances can be understated due to pricing adjustment lags that stem from (generally infrequent) appraisal valuations and thin trading. Second, movements in illiquidity risk and equity risk premia may be more correlated than generally appreciated, to the extent that illiquid assets and equities both tend to perform poorly in times of tight liquidity conditions or during market crises.}

\footnote{32 We received some feedback querying whether lower transaction costs and lower capital gains taxes should be recognized as key benefits of long-term investing. Arguably these are side-effects of longer holding periods, rather than a primary source of advantage in their own right. Net excess return is what matters, not minimization of costs. The real advantage held by a long-term investor relates to greater capacity to manage and optimize the trade-off between liquidating, paying the transaction costs and taxes, and investing a (diminished) amount elsewhere; versus continuing to hold and deferring the costs associated with exit. This advantage relates to discretion over trading. It is worth noting that some shorter-duration strategies can be high turnover and high cost, and yet generate high returns, e.g. momentum. We further develop the link between discretion over trading, investment horizon and costs in the context of discussing illiquidity in Section 6.}
**Advantage 1: Capacity to Adopt and Hold Positions Where Payoff Timing is Uncertain**

Long-term investors have the capacity to pursue investment opportunities where the timing of the payoffs is highly uncertain, but there is a high probability that it will occur eventually. Basically, they have the luxury to be primarily concerned with *if*, rather than *when*, a payoff will occur. This advantage is closely related to *patience* and the ability to be *far-sighted*. To successfully exploit this advantage, long-term investors need to be able to insulate themselves from the influence of near-term noise and uncertainties, and keep their sights on the ultimate goal. There should be little pressure to take action or deliver outcomes immediately. This requires discretion over trading and the capacity to focus on long-term value or returns, i.e. the two characteristics that indicate a long investment horizon. By contrast, the focus of short-term investors on near-term price changes can make it difficult for them to pursue such opportunities. Indeed, the aversion of many investors to such opportunities can be what permits them to occur in the first place. It is not unusual to see some investors avoiding what may be potentially attractive investments because of near-term uncertainties, the prospect of negative news flow for the immediate future, or the lack of evident ‘catalysts’ for market prices to adjust.

This advantage is implicit within many of the discussions in the literature. For instance, Treynor (1976) refers to “ideas that require reflection, judgment and special expertise for their evaluation and hence travel slowly.” This is an acknowledgement that long-term investors are well suited to pursue investments where short-term uncertainty exists and value may only become evident over time. Jones (2012) mentions “tolerance for path-dependence”, which is the conditional ability to withstand and survive losses along the path to securing gains. That is, long-term investors should have greater capacity to sustain positions regardless of the path by which returns are realized. However, being able to do so requires limited risk of losing funding (discussed as ‘limits to arbitrage’ by Shleifer and Vishny, 1997), and restraints on the organizational or behavioural pressures to react when losses occur (see first dot point in Section 4(ii)). Also relevant are the concepts of hyperbolic discounting (Laibson, 1997) and myopic loss aversion (Benartzi and Thaler, 1995). These attributes can engender inconsistency in the pricing of risky investments through time (see discussion in Paper 1). Long-term investors may be well placed to exploit any pricing anomalies associated with these aspects.

**Advantage 2: Ability to Exploit Opportunities Generated by Short-Term Investors**

A second advantage held by long-term investors is that they may be able to exploit opportunities that arise as a consequence of the actions of short-term investors. Paper 1 raised the idea that if the balance is tilted too far towards short-term investing in the markets, this may create opportunities for long-term investors. On one level, these opportunities may arise out of *mispricing* that stems from the actions of short-term investors (as argued by Treynor (1976) and others, for instance). However, ‘mispricing’ is not necessary. Opportunities can also arise from *differences between investors with varying horizons*, such that short-term investors may be willing to reward long-term investors for facilitating their divergent needs. Scholes (2004) identifies two specific ways by which this can occur: liquidity provision and risk transfer.

Liquidity provision is closely related to returns from illiquidity, which is the focus of attention in Section 6, Section 7 and to a lesser extent Section 8. At this point we merely observe that long-term investors have a comparative advantage in providing liquidity to short-term investors. This advantage stems not only from discretion over trading. It is supported by the capacity to focus on long-term value and expected returns, which underpins evaluation of opportunities. The capacity to adopt positions where payoff timing is uncertain (i.e. advantage 1) may also play a role.

Opportunities related to risk transfer can arise where short-term investors value certain risks differently to long-term investors. Long-term investors would look to exploit this advantage through seeking out situations where prices are being set by short-term investors who require a premium to compensate them for a risk that operates within a shorter time frame. Alternatively, this might be interpreted as targeting situations where short-term investors are willing to ‘pay’ to mitigate some short-term risk. Listed below are some risks that are typically of
more concern to short-term investors than long-term investors. Many of these risks reflect the drivers of investment horizon discussed in Paper 1.

- **Illiquidity risk** – The compensation for illiquidity risk is known as the illiquidity premium. It reflects the additional return required by the marginal investor for the risk that they could incur high transaction costs at inopportune times. The illiquidity premium can stem from the actions of short-term investors to the extent that the marginal investor has a short investment horizon. The illiquidity premium should be distinguished from returns to liquidity provision, which is addressed separately below. The effects of illiquidity are discussed in detail in Section 6.

- **Concern with short-term relative performance** – Some institutional investors will be concerned with the risk of underperforming either their benchmark or peer group over shorter horizons, due to the potential impact on funds under management, performance bonuses or careers. The idea that pricing may reflect the influence of delegated management, combined with monitoring using benchmarks, is acknowledged within the academic literature. In addition, short-term investors that are measured against peers may have an aversion to positions that require moving away from the herd. For example, it can be difficult to alter exposure to a widely-held asset class (e.g. equities) due to the peer risk entailed, even when prices or expected returns appear out-of-kilter from a long-term perspective. To the extent that asset prices are driven out-of-line with value on a long-term buy and hold basis by short-term investors focusing on their relative performance, opportunities may be presented for long-term investors.

- **Lack of tolerance for short-term market volatility** – Short-term investors may pay to avoid short-term market volatility as a whole for a number of reasons. Short-term volatility in asset values can matter where concerns exist over short-term obligations related to capital requirements, solvency or spending commitments, e.g. defined benefit fund sponsors, insurance companies, leveraged investments, and pension fund members nearing retirement. In addition, some institutional investors may be concerned with the impact of short-term market volatility on their own income, either via the effect on fund flows and hence assets under management, or their personal remuneration. This will particularly be the case where performance is evaluated on an absolute, rather than relative, basis. Behavioural factors can also decrease tolerance for short-term market volatility, e.g. myopic loss aversion (see Benartzi and Thaler, 1999).

- **Fluctuations in risk tolerance and associated risk premiums** – Risk premiums on offer may fluctuate where a short-term investor is the marginal investor, and their tolerance for accepting risk varies over time. Potential sources of such fluctuations include changes in investor risk aversion, and shifts in the perceived quantum of risk. Long-term investors may exploit these fluctuations where two conditions are met. The first is where they have a more stable (or less pro-cyclical) risk aversion than short-term investors. The second is where the quantum of risk differs across time horizons (Campbell and Viceira, 2005) and the fluctuations relate primarily to short-term risk. Either way, long-term investors would look to accept more risk if risk premiums spike due to heightened concerns over near-term risk by short-term investors, and conversely reduce risk exposures when premiums are low.

The capacity of long-term investors to accept risks to which short-term investors are averse requires a capacity to look through the period when exposure to risk is priced highly in the market, and focus on the payoff from holding the position through time. This requires an ability to determine long-term value or expected returns from taking the position, as well as discretion over trading to retain the exposure.

---

33 Mandate requirements and rebalancing tolerances may also cause institutional investors to react to market developments, e.g. credit rating changes.

34 The influence of institutions managing portfolios against benchmarks has been related to various pricing anomalies, including the influence of index inclusion or exclusion on price movements (Petajisto, 2011) and valuation ratios (Belasco et al., 2012); outperformance of low beta and low volatility stocks (Baker et al., 2011); and the amplification of volatility and generation of countercyclical Sharpe ratios (Basak and Pavlova, 2013). An overview of the economic implications of index inclusion is provided by Wurgler (2010). Vayanos and Woolley (2013) present a theory whereby momentum and reversal patterns are explained through the interaction between career-concerned institutional investors and fund flows.
**Advantage 3: Latitude to Invest in Unlisted and/or Illiquid Assets**

The fact that long-term investors have greater latitude to invest in unlisted and/or illiquid assets presents them with a broader opportunity set than is available to short-term investors. Most of the associated benefits are recognized in the literature, and were identified in Section 2. They include: the possibility that unlisted and illiquid assets may be more subject to market imperfections that give rise to opportunities; adding economic value to unlisted assets through direct control; exploitation of information advantages in unlisted markets by certain investors; and scope for greater diversification. Unlisted assets may offer exposure to sectors, themes and strategies that are not readily available in listed markets.

The latitude that long-term investors have to adopt exposure to unlisted and/or illiquid assets relates to our two indicators of investment horizon. Unlisted and/or illiquid assets demand a longer investment horizon not only because illiquidity makes transacting costly, but also because the timeframe involved in establishing and subsequently exiting positions may be prolonged. The large cost and long lengths of time involved require commitment, which in turn calls for a focus on long-term value or expected returns when evaluating assets. Further, discretion over trading is required. While some degree of discretion is essential, investors that have considerable discretion can buy and sell when it is most beneficial to do so. Hence discretion over trading enhances their advantage from investing in this type of asset.

(ii) Eight Strategies Suited to Long-Term Investors

The main benefit of long-term investing is that it offers access to a broader opportunity set than is available to short-term investors. Long-term investors can, in theory, attempt to do anything that a short-term investor can do, plus some. Figure 1 lists and briefly describes eight classes of investment strategy that are suited to investors with long horizons. It also relates each strategy to the three advantages outlined above. Figure 1 aims to present an organized menu of opportunities which long-term investors may find beneficial to pursue. Most of the strategies are touched on either in Paper 1 or elsewhere in this paper. Part B delves into three of the strategies in detail: capturing the illiquidity premium (strategy 1b), liquidity provision (strategy 2) and dynamic strategies (strategy 8). Value investing (strategy 3) is also touched on in the process, given that the dynamic strategy being investigated is essentially value-based.
## Figure 1: Strategies Suited to Long-Term Investor

<table>
<thead>
<tr>
<th>Investment Strategy</th>
<th>Description</th>
<th>Advantage Being Exploited</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Payoff Timing Uncertainty</td>
</tr>
<tr>
<td>1. Risk premium capture (risk transfer)</td>
<td>Market aversion to short duration risks can generate a range of premiums that might be captured by long-term investors.</td>
<td>Yes</td>
</tr>
<tr>
<td>a) Market risk premium</td>
<td>Concerns over short-term losses have potentially contributed to the historically large market (equity) risk premium. Long-term investors are well placed to capture this premium, aided by any tendency towards mean reversion by markets over the long term.</td>
<td>Yes</td>
</tr>
<tr>
<td>b) Volatility</td>
<td>A volatility premium is observed in variance swaps and volatility futures, with evidence that it is a manifestation of aversion to short-term market fluctuations. Specifically, pricing of volatility derivatives can be linked to large premiums on (OTM) put options.</td>
<td>Yes</td>
</tr>
<tr>
<td>c) Illiquidity premium</td>
<td>Long-term investors have scope to access a premium from illiquid assets to the extent they are less impacted by the costs and risks associated with illiquidity than the marginal investor. Key points of difference between short-term and long-term investors include the impact of transaction costs, and exposure to the risk of being forced to sell assets at considerable cost at the wrong time. These issues are discussed in detail in Section 6.</td>
<td>Yes</td>
</tr>
<tr>
<td>d) Commodities (backwardation)</td>
<td>The Keynes/Hicks theory of normal backwardation proposes that hedgers will pay risk premiums to speculators (investors) in forward commodity markets, which appears in the form of the ‘roll yield’. However, it has been debated whether the ‘financialization’ of commodity markets might have attenuated any premium over more recent years.</td>
<td>Yes</td>
</tr>
<tr>
<td>e) Reinsurance</td>
<td>This involves accepting risks that insurers wish to shed due to concerns over short-term solvency, capital or poorly diversified books, e.g. catastrophe bonds.</td>
<td>Yes</td>
</tr>
<tr>
<td>f) Relative performance risks</td>
<td>Situations may exist where the influence of benchmark or peer-relative risk can result in premiums being available. Examples include: low pricing for ex-benchmark assets; price effects from benchmark rebalancing; and low beta/low volatility anomalies.</td>
<td>Yes</td>
</tr>
<tr>
<td>2. Liquidity provision</td>
<td>This strategy entails two elements. First is capturing ‘price impacts’ by taking the other side of trades, including acting as market-maker or underwriter in private markets. Second is exploiting shifts in overall market pricing arising from fluctuations in liquidity levels or illiquidity risk premiums. The latter is discussed in detail in Sections 6 and 7.</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Value investing</td>
<td>This entails buying assets that are underpriced and/or offering elevated expected returns; while avoiding those overpriced and/or offering low expected returns. Often it involves trading against momentum and market opinion. Payoff timing can be open-ended.</td>
<td>Yes</td>
</tr>
<tr>
<td>Investment Strategy</td>
<td>Description</td>
<td>Payoff Timing Uncertainty</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td><strong>4. Pricing discrepancies across segmented markets</strong></td>
<td>Pricing discrepancies can occur across markets that are related yet segmented due to frictions. These discrepancies may stem from embedded behavioural biases, such as the psychologies or belief systems of distinct investor cohorts in insulated markets. They are best exploited by long-term investors, as these strategies often involve uncertainty in the mechanism and timing of any re-alignment. Examples include unjustified discrepancies between unlisted assets and their listed counterparts (e.g. unlisted property vs. REITs; unlisted vs. listed infrastructure); as well as geographical disparities (e.g. property markets across regions or countries; dual-listed stocks). Potential strategies range from selective direction of available funds; switching exposure between counterparts; and possibly direct arbitrage (only available where it is feasible to short the highly priced component).</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>5. Long-term thematic investing</strong></td>
<td>Long-term thematic investing entails positioning to benefit from slow-moving but persistent trends. As the payoffs typically accumulate over time and may be swamped by volatility over the short-term, this strategy is mainly suitable for long-term investors and likely to be overlooked by short-term investors concerned with near-term price changes. Examples might include the impact of long-term macroeconomic trends, demographic changes, cultural shifts, technological developments and environmental change.</td>
<td>Yes</td>
</tr>
</tbody>
</table>
| **6. Value-add through control and engagement**   | Long-term investors might apply their influence towards generation of additional returns through creation of economic value. This strategy relates to the concept of 'universal ownership'. It also incorporates adding value to private market assets. Strategies include:  
- Engagement with companies to encourage actions that enhance value (activism)  
- Sustainable investing (including SRI, ESG), specifically positive investing  
- Adding value to private assets by changing or incentivizing management, supplying finance, and possibly providing expertise (the private equity model). | Possibly                  | Not central              | Often                      |
| **7. Complex assets**                            | Complex assets may be available at attractive prices as a consequence of opaque value, which can stem from information uncertainty or asymmetry, coupled with the time required for uncertainty to be resolved. Complex assets are well suited to long-term investors with the resources and patience to perform in-depth evaluation and wait for the payoff. Such assets are more likely to be available in private markets, but not necessarily. | Yes                       | Possibly                 | Often                      |
| **8. Dynamic strategies**                        | Dynamic strategies recognize that expected returns can vary through time. Their aim is to follow the optimal path in generating value over the long term. They typically involve buying when returns are high and selling when they are low, which often amounts to a counter-cyclical approach that stands against consensus. There may be overlap with other strategies, e.g. value investing. Dynamic strategies are examined in detail in Sections 7-8. | Often                     | Often                    | Possibly                   |
(iii) How the Future Fund Approaches Selected Strategies

The Future Fund’s perspective on some of the strategies listed in Figure 1 is relayed below. Included is an account of how they view the illiquidity premium and approach thematic investing. They also have an interesting take on the inter-relation between value investing and momentum strategies.

Illiquidity Premium (Strategy 1c)

When the Future Fund invests in illiquid assets, it requires additional returns to compensate for three costs associated with illiquidity. The first relates to the loss of flexibility to reallocate capital to potentially more attractive opportunities for a defined period of time, without bearing unacceptably high transaction costs. They call this the ‘opportunity cost of illiquidity’, and note that some market participants would view the entire liquidity risk premium as related to this opportunity cost. It reflects a surrendering of the right to sell a given investment for the minimum expected holding period should it become overvalued, or to buy equivalent investments (including liquid proxies) should they fall in value. The second component is the incremental ‘cost of liquidity provision’ for an illiquid investment. This cost is imposed by the need to effectively balance at-call liquidity requirements and currency risk at the portfolio level, in the presence of the greater pool of illiquid and/or offshore investments. The third component is the ‘commitment cost of capital’, and relates to the contingent liability of non-discretionary undrawn capital commitments. An example of the latter would be capital held aside to satisfy draw-downs by private equity funds. The combination of these three components sets the required hurdle rate of return for investing in an illiquid asset, relative to a liquid equivalent.

The above characterization differs somewhat to the presentation of the illiquidity premium in this paper under Section 6. This reflects differing purposes. Section 6 aims to characterize the nature and source of the opportunity derived from illiquid investments. It focuses on what determines the ‘gross’ expected return on illiquid assets, and the conditions under which long-term investors are likely to earn returns in excess of their required return. The Future Fund characterization is directed towards building up the required return, to which the return on offer may be compared.

Thematic Investing (Strategy 5)

The Future Fund has identified seven secular themes that may influence the manner in which it invests. These include: debt and deleveraging; policy and politics; demographics; globalization and emerging wealth; resource scarcity; technological innovation; and inflation. The Future Fund views the policy management of the deleveraging process in various parts of the developed world as the key driver of global economic outcomes at present.

While the Future Fund is prohibited under its Investment Mandate from direct investment or execution in overseas markets without Ministerial exemption, it has collaborated with investment managers to access these themes. For instance, in 2010 the Future Fund co-invested with a manager to offer credit to small and mid-sized corporations in Europe, filling a market gap left by banks that had pulled away from providing credit. This investment aligned with the Future Fund’s long-term themes, and could be seen as capturing an opportunity arising as a consequence of capital scarcity related to the actions of ‘investors’ responding to short-term pressures (in this case, tightening regulation and excessive leverage compelling European banks to shrink their balance sheets). Another example is the awarding of mandates to equity managers with the specific purpose of capturing the theme of increasing consumption related to the growth of the middle class in emerging markets. These investments are both good examples of the type of strategies that can be most readily pursued by long-term investors who are unconcerned with either an immediate payoff, or relative near-term performance versus a specific benchmark or peers.

35 This opportunity cost could be priced as two barrier options: a ‘down and in’ call plus an ‘up and in’ put with knock-in levels at a suitable spread around ‘fair’ or market value.
Value Investing (Strategy 3) and Momentum

There is a general perception that value investing sits within the realms of longer investment horizons, while momentum strategies are inherently short term. This view is implicit across much of the commentary on long-term investing versus short-termism discussed in Paper 1. It also seems a natural conclusion given the high turnover and short holding periods typically associated with momentum strategies, often averaging less than a year. Nevertheless, the Future Fund maintains that momentum strategies may be of value to long-term investors. In addition to having proved a persistent source of excess returns (with behavioural roots that suggest they may be sustainable), momentum investing can provide a source of both cross-sectional and temporal diversification for the natural value bias embedded in the portfolios of long-term investors. Value strategies are premised on mean reversion, and rely on successfully estimating the ‘value’ to which prices may eventually revert (see discussion in Section 4). One of the problems is that ‘value’ is a moving feast, as there is always potential for shifts in fundamentals, i.e. regime change. Combining momentum with value strategies may help to create a more robust long-term outcome by hedging some of the vulnerabilities of an inherent value bias related to the difficulty of anticipating shifts in value. That is, momentum strategies might help to protect the portfolio in instances where value shifts unexpectedly because they have a chance of ‘latching on’ to the underlying changes in fundamentals as they unfold.

4. Pitfalls of Long-Term Investing

Long-term investing is by no means a guarantee of success. Access to a broader opportunity set offers potential only. Long-term investors still must implement well. There is nothing about long-term investing that prevents mistakes. What differs is the type of errors to which long-term investors are most exposed, and their points of vulnerability. These are discussed below. We also identify some of the constraints that long-term investors may face.

(i) Potential Errors: Forecasting the Distant Future Is Hard!

Arguably the most important error to which a long-term investor is exposed relates to incorrect expectations about the long term. Many long-term investment strategies rely on evaluating the potential long-term payoffs in terms of scope for correction of mis-pricings or the magnitude of long-term expected returns. While estimates may be explicit or implicit, any investment must be based on some sense for the magnitude of the opportunity, as well as the risk involved. Reliable estimates are not easy to come by. Errors can occur for a number of reasons. They could simply be the result of poor analysis or bad forecasting. Errors can also occur as a consequence of unanticipated changes to fundamentals along the path, such as regime shifts in the underlying profitability of an industry, the economic environment or market conditions. In some instances, gauging the opportunity can be difficult because the fundamentals are opaque. For example, potential returns under thematic investing can be tricky to explicitly estimate, and are subject to the inherent uncertainty of outcomes over long horizons. It can also be hard to judge the extent to which a given theme is priced at the point of entry.

The underlying issue is that forecasting the distant future is hard to do. What is known about the long term can be quite limited and often of low confidence. The future is replete with a multitude of possible scenarios that may proliferate with horizon, and even trend towards entropy. The risk of regime shift is ever-present. There are few constants that can reliably generate returns over the long haul. Attributes such as competitive advantage, access to growth options and good management do not last forever. Indeed, predicting long-term outcomes is arguably harder than predicting what happens next within a prevailing regime. If long-term investing offers excess returns, it is not because the long term is easier to predict. It is because the long term is undervalued by the market.

The consequences of erroneous expectations can go beyond merely undermining the foundation for a position. Prediction errors can have particularly weighty implications when long-term investments are involved. This is because the feedback mechanisms are hazy when investments are based on expectations about a distant future that will not arrive any time soon. It can take some time before any errors start to become apparent. Long-term investors may find themselves holding an investment that has underperformed expectations over a considerable period before the error is fully recognized. The concept of ‘value traps’ is
relevant here: assets that appear cheap are sometimes lowly priced for good reason, which may only become evident afterwards. Even once the error becomes apparent, extraction from such positions can prove problematic. Often an underperforming asset will continue trading on seemingly low prices, at which an exit may seem unjustified, even though the initial rationale for the position has disappeared. Further, many of the strategies pursued by long-term investors involve assets that entail commitment. For instance, it can be difficult to trade out of unlisted, illiquid or opaque assets. 37 And if their fundamentals are under pressure, a large haircut may be required to secure an exit. Many investors are reluctant to acknowledge sunk costs. Basically, long-term investors who make errors face the risk of getting ‘locked-in’ to underperforming positions. In contrast, short-term investors more typically invest in a manner that facilitates turning over their positions, including the utilization of stop-losses. They are less likely to get entrapped, and henceforth move on to try again.

The above discussion is related to the fundamental law of active management and the concept of breadth versus skill, which also has a time dimension (see Grinold and Kahn, 2011). Long-term investments tend to be of lower breadth to the extent that positions are adopted over longer periods and turned over less often. By contrast, short-term strategies, such as trading or momentum investing, tend to be higher breadth because more positions are taken per unit of time.38 The fundamental law implies that strategies with lower breadth rely on greater skill to generate a given level of excess return. Equivalently, return forecasts need to be more accurate to ensure a level of success.

Another error that can be made by long-term investors is implementing at the wrong time or price. This issue is discussed with respect to dynamic strategies under Section 8, where the practical implementation of such strategies is addressed. Buying an asset too early or at a higher price than subsequently observed does not invalidate a position. However, it does entail an opportunity cost and implies a sub-optimal result. For many unlisted investments, implementation is rarely neat. Opportunities to secure assets may come up only occasionally, and pressure to ‘secure the deal’ may lead to an investor paying more than hoped. This is the risk of suffering the ‘winner’s curse’. Possessing discretion over trading and maintaining price discipline is required; but can prove difficult when time and resources have already been committed to a transaction.

(ii) Organizational, Agency and Alignment Issues

Three points of vulnerability are listed and discussed below that are rooted in problems related to organizational design, agency arrangements, alignment and associated behavioural effects. Dealing with these issues is a focus of our attention in Paper 3.

• Reliance on commitment and fortitude – Success in long-term investing requires the capacity to sustain positions. Sometimes this can be difficult to achieve. It is possible for payoffs to take considerable time to eventuate, or for losses to be initially generated and then persist for an uncomfortable period. Under such circumstances, various organizational and behavioural influences may act to undermine commitment to positions. The fact that most investments are made under uncertainty without guaranteed success can help foster doubt and a questioning of underperforming positions. Such doubts can arise from various quarters. The investment board or the funding entity may have lower tolerance for short-term underperformance than initially presumed. Support for long-term investing may be expressed at the outset, but might prove not so solid in the face of seemingly poor results. Organizations comprise of individuals who may hold varying beliefs. Others with a different view may advocate for reversal of the position. Even those responsible for making a decision can suffer from self-doubt if a position is not turning out as expected. Positions are often adopted under agency arrangements. Doubt may be directed at the agent, notwithstanding broad support for the type of strategy being pursued. A response could be to blame the manager, sack them, and get a new one. Deciding whether to hold or fold is often a tortured decision. In some instances, the outcome may be to close a position that should have been retained.

• Employee alignment – Investment staff could be operating on shorter horizons than their organizations or the strategies they are pursuing, due to the fact that they are managing their own incentives or careers. 37 Flyvbjerg (2009) explains how the benefits from major infrastructure projects are often overstated. A related point is that undisciplined buyers may be exposed to overpaying for unlisted assets due to the ‘buyers curse’, aided by lack of any discipline on prices that might stem from the inability of informed players to short.

37 Flyvbjerg (2009) explains how the benefits from major infrastructure projects are often overstated. A related point is that undisciplined buyers may be exposed to overpaying for unlisted assets due to the ‘buyers curse’, aided by lack of any discipline on prices that might stem from the inability of informed players to short. 38 Momentum and other high breadth strategies face their own problems, including the ability and cost of implementing (the implementation coefficient), and limits to the extent to which positions are truly independent.
Remuneration arrangements that are truly long-term are rare in the fund management industry, where it is standard practice to offer the prospect of regular bonuses. As an example, the Future Fund adopts a three-year evaluation period for the component of variable remuneration related to investment performance. This is clearly shorter than the horizon of the organization itself. While this shorter period aligns with their internal investment planning horizon, it also recognizes the realities of the market for investment talent. Investment staff may be concerned about their prospects for promotion or their own market value. Investment managers tend to be more attractive on the job market or have greater scope to set up their own operation if they have generated recent strong performance, than if their potential to deliver is yet to be demonstrated or is under a cloud.

- **Manager alignment** – A related consideration for long-term institutional investors is that their external managers may have short horizons. This can arise as a consequence of the influence of short-term performance on the success of both the fund management organization and its managers, due to the link to assets under management and remuneration. Such problems can be compounded when investing via open-ended, pooled vehicles.

(iii) **Constraints**

Long-term investors may also face constraints on their ability to pursue long-term investing, or make full use of the broader opportunity set they have available. For example, the fact that the Future Fund can use only external managers arguably limits their ability to pursue value-added strategies at the margin, as reliance must be placed on external agents to act on their behalf. However, the Future Fund has designed its investment process to ‘optimize’ around this constraint. In particular, they have forged creative and strategic partnerships with external managers and counterparties that emphasise strong alignment in order to mitigate principal-agent problems.

Typical constraints that may be faced by many long-term investors include the following:

- **Ability to respond to opportunities** – The ability to respond may be constrained by limited internal resources, or the time that is required to evaluate and trade unlisted assets. Opportunities that may appear to exist at face value may not be implementable due to a lack of suitable assets or vehicles. Asset allocation becomes harder to implement when illiquid assets are involved.

- **Mutually exclusive strategies** – Certain strategies may be mutually exclusive. For instance, harvesting risk premiums requires being invested, while liquidity provision needs cash to be held aside to facilitate purchases. Once risk budgets are spent, it becomes difficult to commit to a new opportunity that adds to the exposure. Further, any strategies that represent a real option will be spent once commitment is made and the option ‘exercised’.

- **Lack of access to leverage or short-selling** – Some strategies may not be accessible due to borrowing or shorting constraints. For instance, a situation where unlisted property was valued more highly than REITs cannot be exploited beyond just selling out of unlisted property. As an aside, the Future Fund Act places very tight restrictions on the use of leverage by the Board of Guardians.

- **Currency effects** – International investments involve composite exposures of the underlying asset and its base currency, which can be hard to disentangle without potential consequences. In particular, neutralizing the currency exposure through hedging may have cash flow implications that could undermine the capacity to sustain positions over the long term. If an overseas asset is hedged and the investor’s home currency depreciates, the loss on the hedging contract must be settled with cash. This can create difficulties if the asset being hedged cannot be liquidated, as the cash must be sourced from elsewhere in the portfolio.
5. General Conclusion

This paper addresses the benefits of long-term investing, as well as the pitfalls. Our two characteristics that indicate a long-term investment horizon – discretion over trading, and an investment approach that focuses on the long term – are traced through to three advantages, and henceforth to eight investment strategies that long-term investors may pursue in exploiting these advantages. Pitfalls for long-term investors are identified. The point that adopting a long-term horizon is no guarantee of success needs to be emphasized. Long-term investing may offer potential benefits, but implementation is critical. In this respect, an investment management organization needs to be designed appropriately if long-term investing is to be pursued successfully. How this might be done is the central topic of the third paper in this series.

Part B of this paper now drills down to investing in illiquid assets and dynamic strategies.
Paper 2 - Part B

Detailed Focus on Two Strategies:

A) Returns from Exposure to Illiquidity

B) Dynamic Strategies
6. Returns from Exposure to Illiquidity

It is entirely logical for investors to expect some additional return from illiquid assets, to the extent that illiquidity imposes costs, risks and constraints, which require compensation. This section reviews concepts and evidence relating to the nature and magnitude of the illiquidity premium. Two main messages emerge. The first is that illiquidity premiums are not necessarily substantial, ubiquitous or consistent. A sizable premium need not be available in all illiquid assets at all times. There is considerable evidence that compensation for illiquidity exposure varies over time. The second message is that, to the extent that illiquid assets do offer additional returns, the ability to access these returns will vary across investors. This follows from the notion that illiquid assets partly offer additional gross returns as compensation for their greater costs and risks; yet these costs impact on various investors to differing extents. Investment horizon is critical here: it is long-term investors that are best placed to extract maximum benefit from illiquid assets. A combination of a longer horizon and discretion over trading means that long-term investors are less impacted by both the costs and risks associated with illiquidity, for reasons we expand on below.

Our examination of the returns to illiquidity proceeds as follows. Section 6(i) discusses how illiquidity relates to investment horizon. Section 6(ii) follows with an investigation of how illiquidity manifests in asset pricing and asset returns. Having established the underlying concepts, Section 6(iii) then reviews the literature on illiquidity and asset pricing. Illiquidity has previously been investigated in some depth by the author in a previous paper (Leung and Warren, 2007). The discussion here draws upon that work, which is updated and redirected towards the implications for long-term investors. In particular, the global financial crisis (GFC) of 2007-2009 was instructive given that illiquidity played a central role, most notably in bond markets. It also spurred an active research agenda in related areas. Section 6(iv) summarizes by drawing out the implications for investors.

(i) Illiquidity and Investment Horizon – Basic Concepts

‘Liquidity’ has multiple meanings. Here it is discussed in an asset market context - also known as ‘market liquidity’. A good definition is “the ability to trade large quantities quickly at low cost with little price impact” (Liu, 2006, p631). In essence, liquidity relates to the cost and ability to transact. Illiquid assets potentially have two adverse effects for investors. The first is that investing in illiquid assets is more costly, reflecting both higher transaction costs and the other costs associated with aspects like evaluating and maintaining investments.40 The opportunity costs identified by the Future Fund (see Section 3(iii)) might be considered as components of the additional costs associated with illiquidity. In particular, costs associated with the management of at-call liquidity facilities and the contingent liability of non-discretionary undrawn capital commitments both relate to maintaining an investment program involving illiquid assets. Illiquid assets should be priced to provide an expected return that compensates for all expected costs, to the extent that they impact on the marginal investor.

A key feature of transaction costs is that their impact varies with investment horizon.40 The longer an asset is held, the less that transaction costs reduce realized returns, as they get amortized across more periods (see

---

39 Vayanos and Wang (2013) identify six market imperfections that contribute to illiquidity, including transaction costs, participation costs, asymmetric information, imperfect competition, funding constraints and search costs. Investors in illiquid assets may need to commit resources to build the infrastructure to deal with these imperfections. Many (although not all) illiquid assets involve private markets in which it is more costly to operate, be it either via direct investment or through managers, where fees are typically relatively high.

40 A similar view might be taken of capital gains tax effects upon exit. Such taxes effectively amount to a cost (or benefit) that is incurred along with the transaction, and could be deferred by continuing to hold the investment.
Amihud and Mendelson, 1986). For example, transactions costs of 10% for a round trip (i.e. 5% on both purchase and sale) will roughly reduce returns by 10% if the asset is held over 1 year; but only 2% pa for a 5-year holding period; 1% pa for a 10-year holding period; and so on. Further, transaction costs may vary with market conditions and across investors.

Illiquidity can also manifest in a sub-optimal portfolio due to failure to transact, notwithstanding indications that trading is desirable. In such situations, the impact depends on the circumstances under which the investor doesn’t transact. An investor can find themselves in one of three situations, each with increasingly severe consequences:

a) **Trading is feasible and optional, but it is costly** – Here an investor has the choice of whether to incur the cost of transacting (e.g. accepting a price discount to secure a sale), or persisting with a sub-optimal portfolio. In this situation, persisting with a sub-optimal portfolio may be chosen as the lesser of two potential ‘costs’. Many of the theoretical models mentioned below in Section 6(ii) analyze comparable situations, under which they find that the cost of illiquidity is not overly large.

b) **Trading is feasible, mandatory and costly** – Essentially this is the situation where an investor becomes a forced seller. It might be motivated by the need to meet redemptions, margin calls or prudential requirements. Here the cost of transacting must be incurred, no matter how large. Under such situations, the risks are compounded if the need for mandatory liquidation goes hand-in-hand with high costs of transacting. For instance, the costs, and hence risks, of illiquidity will mount if investors are more likely to become forced sellers in times of market stress. Risks are further heightened if other investors need to sell at the same time, say because many funds are receiving redemptions in response to poor performance. The academic literature related to such situations was discussed in Paper 1.

c) **Trading is required, but is infeasible** – This situation can emerge where trading is required due to (say) redemptions or a loss of funding, yet becomes infeasible due to some restriction - possibly that no market exists at the time. The latter (briefly) occurred within the corporate bond markets during the GFC.

Needless to say, the consequences of being in such a situation could be dire, perhaps even threatening business survival. The potential ‘cost’ is also difficult to quantify.

The discussion above presents what is a complex picture of how illiquidity may impact various investors. A key point is that long-term investors are less affected by the costs, risks and constraints imposed by illiquidity. Discretion over trading – one of the two indicators of a long-term investor identified in Paper 1 – is pivotal for two reasons. First, long-term investors have the option to continue holding. Effectively, they can use their discretion over trading to manage around the transaction costs. They may defer the cost of exit, and hence spread the total cost of transacting in illiquid assets over more periods. Indeed, at the extreme they can even avoid the cost of exit altogether by retaining an asset indefinitely. Second, discretion over trading means that long-term investors are never placed in either the second or third situations of being a forced seller that needs to accept a large haircut, or (worse) needing to sell but being unable to do so. The worst situation they face will be the need to choose between trading versus persisting with a sub-optimal portfolio. The implication is that investors with high discretion over trading are less exposed to the risks associated with illiquidity.

Admittedly, it is unrealistic to expect that long-term investors will retain full and unfettered discretion over trading. Nevertheless, they can possess considerably greater discretion over trading than other, more short-term investors. The implication is that illiquidity is of less consequence to long-term investors, who are better placed to reliably access any higher returns on offer from illiquid assets. They also have scope to pursue dynamic strategies involving illiquid assets, as will be discussed in Sections 7 and 8.

(ii) **Illiquidity, Asset Prices and Returns**

Before providing a review of the evidence on the illiquidity premium, it is important to establish how illiquidity manifests in the pricing of assets and the expected returns on offer. The presentation below is designed to be informative, rather than mathematically precise. The aim is to establish three points:
a) **Basis of pricing is the impact on the marginal investor:** Asset prices and hence the gross (i.e. pre-cost) expected returns on illiquid assets will reflect the compensation required by the marginal investor for the expected risks and constraints associated with illiquidity.

b) **Net returns will vary across investors:** The return that an investor realizes from an illiquid asset depends on aspects such as holding period, and the level of transaction and other costs they actually incur. Investors with longer horizons can expect to earn more after costs than the market clearing rate of return set by the marginal investor, reflecting amortization of costs over longer expected holding periods and the ability to avoid large transaction costs, such as those associated with becoming a forced seller. The existence of transaction and other costs also create difficulties for the measurement of realized net returns and hence identification of the realized premium from holding illiquid assets. Indeed, different investors will achieve differing net outcomes from the same observed market return series.

c) **Valuation measures are the best indication of available return premiums:** Given the tenuous nature of return-based measures, valuation measures provide a better indication of the potential advantage in holding an illiquid asset at any point in time. The extent to which an illiquid asset sits at a valuation discount (or yield premium) to a liquid counterpart directly reflects the extent to which additional returns are available as compensation for both the illiquidity premium and expected transaction and other costs.

**Characterizing Expected Returns under Illiquidity**

Figure 2 sets the scene for discussion by identifying components of the expected net return from investing in an illiquid asset. Net return refers here to the return that the investor expects to realize after any costs. The first component is the gross return that the investor expects the market to deliver, prior costs. This return is available to all investors and is typically observed in many databases. For instance, equity returns based on period-to-period prices reflect the average experience of a buy and hold investor without any direct allowance for transaction and other costs that would have been incurred by investors trading in the market.41 The gross market return might be thought of as comprising the return to a comparable asset that is completely liquid, plus any compensation for illiquidity exposure. The latter comprises the compensation for both the expected costs and risks associated with illiquidity. Compensation for illiquidity risk is the illiquidity risk premium, which much of the (more recent) academic literature attempts to extract by comparing returns from illiquid and liquid assets.

The other component of net return is the expected cost of accessing the asset. This comprises transaction costs on entry, transaction costs on exit and any other costs.42 As discussed earlier, these cost components are typically larger for illiquid assets and can be inherently investor-specific. In particular, expected exit cost is investor-specific because it depends on the circumstances under which exit occurs. It will be a complex function of aspects such as the investor’s intended holding period, expected market conditions upon exit, their discretion to respond to changes in market conditions in choosing the time of exit, and other investor-specific aspects, such as market access and capital gains taxes. The effect of the entry costs on net return can also be investor-specific, even though the entry cost may be known at purchase. This is because the return impact depends on holding period. The investor-specific nature of the cost components means that investors will have different expectations for the net return from the same asset, even if they share the same expectation for gross return.

The investor-specific nature of costs also plays havoc with estimating the illiquidity premium from return data. The cost of transacting is an integral component of realized returns from illiquid assets, yet it cannot be readily

---

41 Closing prices may include the impact of transaction costs where the final trades reflect either a buy trade (at the ask price, including any market impact) or a sell trade (at the bid, including any market impact). However, these effects wash out as noise in a time series measured over multiple periods, where closing prices reflect a spectrum of buy/sell trades. This is related to the concept of ‘bid-ask bounce’ (see Roll, 1984).

42 These other costs are related to establishing an infrastructure to invest in illiquid assets, including locating, evaluating, securing, monitoring and maintaining investments, including liquidity and capital commitment cost. These costs can be minimal in very liquid markets. For instance, for US Treasuries, transaction costs are very low, and there is an absence of other costs related to market imperfections identified by Vayanos and Wang (2013), such as participation costs, search costs and asymmetric information.
accounted for in analyzing available return data. Estimation of a realized net return requires assumptions about when transactions occur and at what cost. These aspects are not only hard to observe, but will always be specific to a particular investor or assumed strategy.

Figure 2: Anatomy of Expected Returns from Illiquid Assets

\[
E[\text{Net Return}] = r(E[\text{Gross Market Return}] - E[\text{Cost}])
\]

**Gross Market Return** = **Return on Liquid Equivalent** + **Compensation for Illiquidity**

\[
\text{Cost} = f(\text{Entry Cost}, \text{Exit Cost}, \text{Other Costs})
\]

**Net Return** is what matters. But it tends to be unobserved, as transaction costs are investor-specific and often not visible.

It is the realization of Gross Market Return that is typically observed in the data.

Cost is not readily observed in the data, and must be estimated. Further, it varies across investors and time.

**Compensation for:**
- a) Expected costs
- b) Illiquidity risk (illiquidity risk premium)

**Entry Cost** may be known upon investment; but effect on net return p.a. depends on how long asset is held.

Exit Cost is investor-specific. It depends on:
- When (or if) sale occurs, and ...
- Cost at time of sale (including market impact, tax)

Discretion over trading is critical:
- **Lack of discretion** => possibility of becoming a forced seller, potentially into a weak market
- **Full discretion** => capacity to compare exit cost vs. implications of continuing to hold

Other Costs include aspects like research, search, monitoring, and maintaining positions; including any liquidity and capital commitment costs. These costs are typically larger for illiquid assets.

**Iliquidity, Price Levels and Valuation Measures**

We now investigate how illiquidity translates into the level of prices, valuation ratios and yields. Consider two assets that are equivalent in all respects except for their liquidity. Both assets generate free cash flows from operations with the same expected value and riskiness. One asset is totally liquid, and can always be traded at zero cost at all times. The other is illiquid, meaning that transaction costs are incurred upon trading. Further, exposure to illiquidity often entails an element of non-diversifiable risk, related to the chance of suffering poor returns and possibly the need to liquidate in adverse times, thus justifying an illiquidity premium. Under these circumstances, the price of the illiquid asset should sit at a discount relative to the liquid asset for two reasons.

First, the expected present value of transaction costs – which can be considered a negative cash flow – should be impounded in the asset price. Second, the need to compensate for illiquidity risk via an illiquidity premium amounts to a higher discount rate being applied to the available cash flows for the illiquid asset.\(^{43}\)

Equations (1) and (2) present these concepts in the form of valuation expressions for the liquid and illiquid asset respectively. Equation (1) values the liquid asset. It appears in the form of a standard constant-growth dividend discount model, for an asset that generates an expected free cash flow \((C_f)\) growing at the constant

\(^{43}\) It may be debated whether the illiquidity premium should be incorporated only via the discount rate applied in estimating the expected present value of exit costs, and not the discount rate applied to operating cash flows. In any event, we put aside this issue to avoid over-complicating the exposition.
rate \((g)\) in perpetuity, discounted at the rate of \(k_{LIQ}\). Equation (2) values the illiquid asset. It incorporates additional terms for the liquidity premium \((LP_{ILLIQ})\), the transaction cost on entry \((TC_{Ent})\), and the net present value of the expected transaction cost on exit \((NPV(E[TC_{Exit}]))\). The latter is the present value of what could be a complex distribution of potential future exit dates and transaction costs (including any price discounts to ‘fair value’ upon exit). Note that we ignore other costs here, although clearly their present value might also be included in Equation (2) as an additional term. Equation (2) can be considered as representing the quoted mid-point market price\(^{44}\) for the illiquid asset that would be viewed as reasonable by a marginal investor who is impacted by illiquidity. Equation (3) represents the price discount for the illiquid asset relative to its liquid counterpart, derived as the ratio of Equation (2) to Equation (1) minus one. It says that illiquid assets should sell at a discount to the extent that the illiquidity premium or expected transaction costs are greater than zero. Equation (3) also doubles as an estimate for the valuation discount on which the illiquid asset will trade, noting that income from operations (i.e. \(CF\)) is a common denominator under the assumptions. Similarly, the reciprocal of Equation (3) generates the cash flow yield premium for the illiquid asset.

### Valuation Equations

\[
P_{LIQ} = \frac{E[CF]}{k_{LIQ}-E[g]} \tag{1}
\]

\[
P_{ILLIQ} = \frac{E[CF]}{k_{LIQ}+LP_{ILLIQ}-E[g]} - TC_{Ent} - NPV(E[TC_{Exit}]) \tag{2}
\]

### Illiquidity Price Discount (= Price/Cash Flow Multiple Discount)

\[
\frac{P_{ILLIQ}}{P_{LIQ}} - 1 = \frac{k_{LIQ}-g}{k_{LIQ}+LP_{ILLIQ}-g} - \frac{(k_{LIQ}-g)(TC_{Ent}+NPV(E[TC_{Exit}]))}{CF} - 1 \tag{3}
\]

Where:

- \(P_{LIQ}\) = Price of liquid asset, period 0
- \(P_{ILLIQ}\) = Price of illiquid asset, period 0
- \(CF\) = Free cash flow from operations, period 1
- \(g\) = Growth rate in free cash flow, beyond period 1
- \(k_{LIQ}\) = Cost of capital for the liquid asset
- \(LP_{ILLIQ}\) = Liquidity premium required in illiquid asset
- \(TC_{Ent}\) = Transaction cost on entry
- \(NPV(E[TC_{Exit}])\) = Net present value of the expected transaction cost on exit
- \(E[\cdot]\) = Expectations operator

Figure 3 gives a sense for the order of magnitude for potential price discounts. Estimates are presented across indicative assets at three different levels of illiquidity denoted ‘reasonable’, ‘limited’ and ‘poor’. The baseline assumptions for the liquid asset include a cost of capital of 10% and a constant growth rate of 4%, which translates to a multiple of 16.7 times on prospective free cash flow and a free cash flow yield of 6%. Across the range of illiquid assets, we allow for illiquidity premiums of 0.5%, 1.0% and 3.0% and entry costs of 1%, 2% and 5%. Exit costs are modeled based on a simple distribution which allows for a 10% probability of selling the asset in each of years 1 through 10. For most part we assume a ‘normal’ transaction cost upon exit, equal to that on entry. However, under the ‘limited’ and ‘poor’ liquidity cases we allow for a small probability (of 1% and 2% per period) of incurring a much larger cost (of 10% and 25%) through becoming a forced seller. The price and valuation discount ranges from -10% under ‘reasonable’ liquidity, to -18% under ‘limited’ liquidity, to -41% under ‘poor’ liquidity. The free cash flow yield premiums are +0.6%, +1.0% and +4.1% respectively. These estimates seem within the ballpark of magnitudes reported in the literature, as discussed in Section 6(iii).

\(^{44}\) Actual transaction prices may deviate from this value, reflecting the bid-ask spread or market impact when transacting. Our presentation effectively treats any such deviations from the mid-point as a transaction cost.
How should these estimates be interpreted? It is important to recognize that they reflect fair value for a representative marginal investor who values an asset on the basis of certain assumptions. In the examples as presented, the estimates reflect an investor who sees themselves as equally likely to exit at any time over the next 10 years, with some risk of doing so as a forced seller under two of the three cases. The price discount reflects the compensation that this marginal investor requires to cover the expected cost of transacting and the risks involved in being exposed to illiquidity. The yield premium is perhaps the best guide to the amount of additional gross market return that is on offer to cover these aspects. The further implication – and the most important in the current context – is that this yield premium provides a guide for the potential ‘fat’ available to investors who would be able to invest in the asset at near-zero cost. Such investors are most likely to be long-term investors. They can expect to earn an additional return in the illiquid asset somewhere greater than the expected liquidity premium, but less than the estimated yield premium. The actual expected return will depend on their expected transaction costs and holding period.

Expected Return and Investment Horizon

Figure 4 draws on the analysis underpinning Figure 3 to demonstrate how returns are investor-specific and depend on holding period. It hence illustrates the advantage faced by long-term investors in illiquid assets. We draw the underlying pricing and exit cost data from the ‘limited’ liquidity (middle) case. Two lines are plotted. The lower solid line plots the internal rate of return that the marginal investor expects to realize depending on how long they end up holding the illiquid asset. The longer they hold, the higher the return. This is a simple reflection of the fact that we have assumed the same expected exit cost and pricing parameters whichever year they exit, so that deferring exit leads to a larger internal rate of return (IRR) as transaction costs are ‘amortized’ over more periods.45 The upper dashed line plots the expected IRR per holding period for a long-

---

45 In actual fact, the decision to exit will not be random, but is likely to occur in response to market developments, e.g. the sale may occur either when it is required, or perhaps because the price moves too high. The latter aspect is the focus of the dynamic strategies addressed in Sections 7 and 8.
term investor who differs in two respects. First, they perceive an equal chance of exiting in each of the next 20 years (versus 10 years for the marginal investor). Second, we assume that the long-term investor only ever pays a normal exit cost as they will never be a forced seller. Clearly the illiquid asset presents as a far more attractive investment to a long-term investor who benefits from the combination of a longer horizon and capacity to avoid the costs associated with being a forced seller. They can expect to earn a return premium over the marginal investor, who sets the market price.

![Figure 4: Internal Rate of Return per Holding Period](image)

Identity of the Marginal Investor

Given that the capacity of long-term investors to generate excess returns from illiquid assets relies on them being less impacted by illiquidity than the marginal investor, the identity of the marginal investor is central. If the marginal investor is a long-term investor with discretion to continue holding if so desired, the compensation required, and hence the excess return available, may be much diminished. The converse applies if the market is populated by short-term investors who need (or may need) to trade. Three considerations are relevant in this respect:

- **The identity of the marginal investor may be influenced by self-selection or clientele effects.** Investors will tend to gravitate towards assets offering a level of illiquidity that meets their needs. Illiquid assets are thus more likely to be held by investors with high tolerance for illiquidity; while investors with a low tolerance for illiquidity are unlikely to be found operating in illiquid markets in the first place. To the extent that the marginal investor is one that perceives the costs and risks associated with illiquidity to be low, the impact on pricing may be greatly attenuated.

- **Participants might take into account the likely reaction of other players when pricing assets.** Elements of game theory can creep into price determination. If the counterparty is perceived as having much to gain, most people attempt to negotiate some of the benefit for themselves. For example, a corporate seller of a private business to a private equity fund could have some sense of the potential value of the business under a future IPO. The seller is likely to bear this in mind when negotiating the deal.

- **The marginal investor can change over time.** Markets for illiquid assets are often ‘thinner’, in the sense that there are typically fewer buyers and sellers. This can make the market equilibrium sensitive to fluctuations in the
identity and balance of buyers and sellers, and the terms on which they are willing to deal. Prices can be volatile as a result. At times, illiquid assets can be purchased in a ‘buyers’ market’, where sellers are either desperate or driven by other agendas, and confronted by a limited number of picky buyers. For instance, the compensation for illiquidity may increase because some investors unexpectedly lose their security of funding and hence develop a need for liquidity, as happened, for instance, in the fixed income markets during the GFC and in the convertible bond markets in 2005 (see Mitchell et al., 2007). At other times, illiquid assets are highly sought after and it becomes a ‘sellers market’. This seems to describe the current market for core unlisted property and infrastructure.

Concluding Comments

It defies logic that illiquidity premiums will always be large and consistently available. Self-selection, clientele effects and negotiating positions can reduce the degree to which illiquidity influences asset prices. The available illiquidity premium can depend on the relative market power of buyers versus sellers, which may shift over time. Evidence examined in Section 6(iii) confirms that the illiquidity premium can vary substantially across markets and through time. This helps underpin the potential value of dynamic strategies, to be investigated in Sections 7 and 8.

Another message is that returns available from illiquid assets can be over-stated due to a failure to properly account for the costs of transacting in illiquid assets. Gross market returns are often the object of empirical analysis. This does not satisfactorily account for the effect of costs on realized net returns because it implicitly assumes that an investor could have traded at the observed price without cost. The estimated returns are hence not realizable, as real trades would incur hidden transaction costs, including market impact. Returns could further be reduced by the other additional costs associated with investing in illiquid assets. Examining gross market returns in isolation can thus create an illusion that the illiquid asset generates a return premium that is unavailable to many investors. Against this background, we now review the evidence from the literature.

(iii) Literature on Illiquidity and Asset Pricing

The preceding discussion provides background for interpreting what is a large and growing body of literature on the relation between illiquidity and asset prices or returns. We selectively summarize this literature, with the aim of conveying a sense for the findings, rather than providing comprehensive coverage. Our review is divided into four parts: theoretical models, the relation between illiquidity and returns; price or valuation discounts for illiquidity; and evidence of time-variation in illiquidity premiums. The broad conclusion is that, while some premium is typically on offer for holding illiquid assets, its magnitude is unclear and probably less than it appears at face value. The premium also varies across markets and through time.

As discussed above, the larger costs associated with illiquid assets are influential in determining how much additional return can be extracted from illiquid assets. The fact that costs are not effectively accounted for in the data, plus the notion that their effect varies across investors, serves to obscure measurement of the illiquidity premium. If anything, measures of the additional return to illiquid assets extracted from the data tend to provide a sense of the maximum incremental return available to investors who incur minimal transaction and other costs and hold for long periods. Available evidence seems to suggest that an illiquidity premium of well below 2% pa might be expected in most instances. However, the premium can expand substantially on occasions, when markets are under stress and liquidity is highly valued.

Theoretical Models of the Illiquidity Premium

A number of authors attempt to derive the illiquidity premium from theoretical models (e.g. Constantinides, 1986; Heaton and Lucas, 1996; Vayanos, 1998; Browne et al. 2003; Huang 2003; Lo et al., 2004; Longstaff, 2001, 2009; Ang et al., 2013). While results are highly dependent on the particular model and its parameterization, in most cases the derived premium is quite modest. The majority of reported illiquidity premiums sit in the 0.5%-2% pa range under plausible parameters; although higher and lower numbers can be teased out. Affording investors the flexibility to manage around the costs of illiquidity is a key aspect
restricting the magnitude of the premium under these models. One such element is permitting investors to trade-off incurring transaction costs against portfolio optimality, under the assumption that assets can be traded at some price. Another element is allowing investors the latitude to restrict exposure to illiquid assets in the first place. Under these conditions, the illiquidity premium (i.e. the additional return in excess of compensation for transaction costs) becomes tied to the extent to which transaction costs and constraints act as a barrier to achieving a more optimal portfolio, with the latter typically evaluated under some asset pricing model encapsulating investor objectives, e.g. a utility function. As the loss of utility from failing to attain the optimal portfolio is often not large, relatively modest illiquidity premiums emerge as a consequence.

**Illiquidity and Realized Returns**

Another approach involves extracting the ex post premium for illiquidity from return data. This task is made difficult by the fact that any premium for illiquidity risk is not directly observable, and controls are required for elements such compensation for expected transaction costs and other forms of risk. Basically, illiquid assets often appear to generate higher returns than liquid assets. But care is needed to distinguish how much of this additional return is due to an illiquidity premium, compensation for expected trading and other costs, or returns associated with other risk factors. In particular, the effects of illiquidity may need to be disentangled from other risks related to size, given that that size and illiquidity tend to be highly correlated. An account of selected results from the literature appears below.

- **Listed equities** – A number of authors have analyzed equity market data to tease out the illiquidity premium after allowing for various controls (e.g. Pástor and Stambaugh, 2003; Dimson and Hanke, 2004; Acharya and Pedersen, 2005; Liu, 2006; Watanabe and Watanabe, 2008; Lee, 2011; Amihud et al. 2013). It is often difficult to extract a clean measure of the “average liquidity premium” from these papers, as modeling methods and presentation varies considerably. Nevertheless, the results point to a return difference between the least liquid and most liquid stocks in the order of 5%-8% pa (based on either quintile or decile portfolio sorts). However, these results are based on reported closing prices, and hence reflect ‘gross’ returns that fail to account for the differential cost of transacting illiquid versus liquid stocks. After controlling for expected costs, the ‘pure’ compensation for illiquidity risk appears like it could in the order of 1%-2% pa for developed markets (e.g. see Acharya and Pedersen, 2005; Lee, 2011). Unsurprisingly, estimated premiums are much higher within emerging markets (see Bekaert et al. 2007; Lee, 2011).

- **Fixed income** – Houweling et al. (2005) extract a measure of the illiquidity premium from returns in Euro denominated bonds during the period 1998 to 2001, after controlling for exposure to risk factors and various characteristics. They estimate a significant but modest illiquidity premium of between 13bps and 23bps, although their analysis is based around sorting into 2 or 4 portfolios. Lin et al. (2011) find much larger returns to illiquidity for corporate bonds in the context of factor models and portfolio sorts across a sample which includes sub-investment grade issues over the period from January 1994 to March 2009. The gross return difference across high-low decile portfolios sorted by liquidity exposure is 3.5%-4.1% pa, including an estimated illiquidity risk premium component of 2.7%-3.3%, based on their illiquidity betas and the illiquidity risk premium.

- **Hedge funds** – Sadka (2010) uncovers a tendency for hedge funds to load on illiquidity. Sadka finds that funds with the most significant exposure to illiquidity risk subsequently outperform those with low exposure by about 6% pa on average over the period 1994–2008, while having generated negative performance during liquidity crises. Teo (2011) confirms and extends Sadka’s findings in reporting that hedge fund returns arising from exposure to illiquidity are magnified by fund flows, such that better performance is associated with larger inflows. Further, the effects from flows appear stronger in times of market stress. It should be remembered that these returns derive from the nature of the underlying investments held by hedge funds, and not as a return to the illiquidity of the hedge fund structures themselves.

- **Private equity** – The extent to which private equity generates excess returns has been a topic of considerable debate in the literature. Notwithstanding this, Franzoni et al. (2012) and Kinlaw et al. (2014) attempt to estimate the component of private equity returns that can be attributed to illiquidity. Both come
up with estimates of around 2½%-3% pa. However these estimates should be considered of low reliability, given the difficulties involved in analyzing the coarse cash flow and appraisal valuation data that is available for private equity funds. They also do not allow for the additional costs incurred by investors in private equity funds, such as research, monitoring and capital commitment costs.

- **Property** – Analysis of the relative performance of listed and unlisted property investments reveals no clear evidence of an illiquidity premium. Pagliari et al. (2005) find no significant difference between US REIT and unlisted property returns over the period 1981 to 2001 after controlling for property type, leverage and appraisal valuations. Indeed, REITs outperformed unlisted property, while the deviation from NTA averaged approximately zero over the period. Shuck and Howard (2004) examine returns in Australia, the UK and the US and similarly found that listed property outperformed unlisted property. These findings may reflect the time periods being examined, bearing in mind that REITs suffered heavily around the time of the GFC. Properly controlling for all differences to ensure a like-with-like comparison is also difficult. Nevertheless, the results do nothing to suggest that there is a reliable illiquidity premium available in unlisted property markets.

**Price or Valuation Discounts for Illiquid Assets**

Section 6(ii) discussed how illiquid assets should trade at a price discount or yield premium in reflection of the combination of any illiquidity premium (i.e. higher discount rate) and the capitalized value of the transaction and other costs expected by the marginal investor. Consistent with this notion, ample evidence exists that illiquid assets can indeed trade at substantial price discounts or yield premiums, often of similar magnitudes to the estimates presented in Figure 3.

- **Equities** – Price discounts of between 15% and 30% have been observed for private companies relative to public company counterparts. Kooli et al. (2003) examine this issue in some depth. They point to previous literature reporting discounts ranging between 14% and 47%. Their own analysis, based on acquisitions matched by firm characteristics, reveals discounts of between 17% and 34% based on valuation multiples, or 16% based on regression analysis controlling for other factors. Officer (2007) also compares acquisition multiples on private company transactions with those on comparable public companies. The average discount ranges between 15% and 30% across four valuation measures. Discounts are also observed for listed stocks, where there exists an equivalent exposure but differences in liquidity. Silber (1991) finds that US restricted stock traded at a discount of over 30% over the period 1981-1988. Hou and Howell document discounts averaging 70%-80% for restricted stock in the Chinese market. Dimson and Hanke (2004) find that equity-linked bonds46 traded at discounts of between 1% and 9% to their indices in the UK during the 1990s. Aguiar and Gopinath (2005) document fire-sales of Asian companies during the crisis of 1997-98, with the 1.3x median price/book ratio for acquisitions during 1998 being over 60% below that observed during 2006.

- **Sovereign bonds** – Given that default risk is typically insignificant in sovereign bonds, these markets offer an arena to study the pricing effects of differences in liquidity that abstracts from any confounding effects from cash flow risk. Ample evidence emerges that differences in liquidity can be associated with meaningful differences in pricing or yields. One piece of evidence arises from the yield differences between “on-the-run” and “off-the-run” issues. For example, Amihud and Mendelson (1991) document an average yield premium of 43bps on US treasury bills over treasury bonds with less than 6 months to maturity, which they attribute to relative liquidity. Longstaff (2004) estimates price discounts for treasury-guaranteed bonds issued by Refcorp of around 10%-15% versus comparable US treasuries. Boudoukh and Whitelaw (1991) report yield differentials between the benchmark Japanese government bond and other comparable bonds of between 30bps and 100bps. Unfortunately, the clarity of these tests is polluted by the possibility that “on-the-run” issues may offer other attributes such as repo ‘specialness’. Vayanos and Weill (2008) investigate this issue. They suggest that the majority of the average difference of about 50bps between on-the-run and off-the-run US treasuries can be explained by specialness, leaving a relatively small role for illiquidity under their analysis. Some authors have examined the impact of illiquidity on the relative pricing

---

46 These products were similar to an ETF over a specific index, but were relatively illiquid.
of US conventional and inflation-linked bonds, generating estimates that inflation-linked bond yields contain an illiquidity premium averaging about 30bps-70bps (see D’Amico et al., 2010; Pflueger and Viceira, 2011; Christensen and Gillan, 2012).

- **Corporate bonds** – Illiquidity is an important feature in the pricing of corporate bonds (see Chen et al., 2007). Indeed, Bao et al. (2011) argue that illiquidity is a more important determinant of credit spreads than default risk. They estimate that for two bonds in the same rating category, a one standard deviation difference in illiquidity leads to a 65bps difference in yield spread. de Jong and Driessen (2012) estimate that the illiquidity risk premium averaged about 60bps for US investment grade and about 150bps for speculative grade bonds over the period 1992-2002, along with similar estimates for Europe. Liu et al. (2006) examine interest rate swaps. Although their estimated illiquidity premium averaged only 7bps over the period 1988 to 2002 (versus 31bps for expected default), it jumped into the 10bps-60bps range after the Long Term Capital Management (LTCM) incident. They also find the illiquidity yield premium to increase with maturity, rising to around 70bps for 10-year maturities.

- **Property** – Benveniste et al. (2001) use regression analysis to compare the pricing of REITs and unlisted property. They estimate the uplift in value that might be attributable to the listing of property. Their regression slope indicates that price increases with liquidity, indicating that the improvement in liquidity achieved through listing may increase value by 12%-22%. However, their regression equation has a negative intercept and listed property still trades around NTA on average. The authors interpret their results as reflecting the notion that the benefits of greater liquidity can be offset by the greater costs associated with being listed, leaving listed property priced around NTA on average.

- **Infrastructure** – There is limited academic evidence on the impact of illiquidity on returns and pricing in infrastructure. Nevertheless, we offer some observations based on the experience of the Future Fund from its operations in this area. Over recent years, transactions have occurred in the private infrastructure markets at prices that at times well exceed the valuations of comparable listed infrastructure (notionally allowing for differences in the nature of the assets, leverage and risk). An underlying cause seems to be a large volume of long-term funds earmarked for investment in unlisted infrastructure, relative to the restricted supply of available assets. As a consequence, the marginal investor in the unlisted market appears to be a long-term investor with high tolerance for illiquidity. Segmentation appears to have occurred between the unlisted and listed markets, with prices in the listed markets seemingly set at the margin by equity investors who demand a premium for illiquidity. There are potential reasons for some pricing discrepancy, such as a willingness to pay a ‘control premium’ for unlisted assets, and the risk that some listed entities may suffer from poor shareholder alignment with the attendant risk of value-decretive corporate actions. Nevertheless, the magnitude of the difference suggests the absence of any illiquidity premium for unlisted infrastructure. Looking forward, scope exists for a significant increase in supply, given the increasing global focus on infrastructure funding and (in Australia’s case, at least) privatization plans. It will be interesting to see if this leads to an illiquidity premium emerging for unlisted infrastructure.

- **Other** – Brenner et al. (2001) report an average discount of around 20% between equivalent non-tradable and exchange-traded options on the Israeli shekel.

### Variation in Compensation for Illiquidity Exposure over Time

The notion that illiquidity varies through time is not only intuitive, but is strongly supported by the empirical evidence. In part illiquidity varies because it is related to market and economic conditions (see Jensen and Moorman, 2010; Næs et al., 2011). During bear markets there tend to be more sellers than buyers, so that large price concessions can be required to secure a transaction. This makes the prices of illiquid assets sensitive to market conditions, which in turn establishes illiquidity as a systematic risk. The fact that the compensation for illiquidity exposure can vary considerably provides the foundation for considering a dynamic approach to capturing the returns associated with illiquid assets.

- **Equities** – Pástor and Stambaugh (2003) established that illiquidity is a priced factor which varies over time and is correlated with both return realizations and the average level of stock returns. Watanabe and
Watanabe (2008) explicitly examine the time-varying nature of illiquidity premium in the US equity market. They uncover two liquidity states. The high liquidity state that applied the majority of the time, during which the illiquidity premium is flat. The low liquidity state was observed about 10% of the time, during which they observe a return spread of over 5% per month across decile portfolios with high versus low exposure to illiquidity risk. Xue and Zheng (2010) also provide evidence of differing liquidity states by applying the Acharya and Pedersen (2005) liquidity CAPM to S&P500 stocks over the 2004-2006 and 2007-2008 periods. They find that the market required greater compensation for illiquidity during the GFC (2007-2008), reflected in changes in both the magnitude of the illiquidity risk premium and the liquidity betas of stocks. Ben-Raphael et al. (2013) conduct a long-term analysis back to the 1930s. They find that illiquidity premiums available in the US equity market have declined over time, reaching minimal levels in all but the smallest stocks during more recent years. In summary, the literature suggests that illiquidity premiums in equity markets may be available only in certain market segments or at certain times, rather than being ubiquitous.

- Fixed income – Similar evidence of time-varying illiquidity premia emerge from the analysis of bond markets. For instance, estimates of the illiquidity component in the yield differential between conventional and inflation-linked bonds (TIPs) has been found to range from a few basis points, up to over 200bps in the early years of TIPs issuance and again during the GFC (see D’Amico et al., 2010; Pflueger and Viceira, 2011; Christensen and Gillan, 2012). In corporate bonds, the estimates by Liu et al. (2006) of the illiquidity premium contained in corporate bond swap rates start from low or even negative levels prior to the LTCM incident in 1998, then jump into the 10bps-60bps range. Dick-Nielsen et al. (2012) generate specific estimates of the variation in the illiquidity component in corporate bond spreads associated with the GFC. They find that it moved from 4bps prior to the GFC up to 93bps for BBB debt, and from 58bps to 197bps for speculative grade debt; before reverting to almost pre-crisis levels by mid-2009. Bao et al. (2011) also find that changes in illiquidity are a significant driver of credit yield spread changes through time, particularly during the GFC. We add our own comment here that the blow-out in corporate bond spreads during the GFC and their subsequent reversion can only be explained by allowing for large variations in the illiquidity premium. For instance, the US Baa-treasury yield spread moved from 100-150bps to 700-800bps during the GFC, and has since returned to 200-250bps. Given that Moody’s report a default rate for Baa debt that averages about 0.7% since 1970, with a maximum of 1.6% in 1938, it is clear that such large swings in the credit spread cannot be fully explained by default risk alone.47

(iv) Discussion

The concepts and empirical evidence reviewed in this section deliver the following messages with regard to the ability of long-term investors to extract additional returns from illiquid assets:

- **Long-term investors are well placed to extract any additional returns from illiquid assets.** The key advantage of long-term investors derives from discretion over trading, which leads them to be less impacted by both the additional costs and risks associated with illiquid assets.

- **The marginal investor matters.** Long-term investors should only expect a benefit to the extent to which they are less impacted by the costs, risks and constraints associated with illiquidity than the marginal investor. Investors are well advised to consider the identity of the investor or group of investors that are setting prices before committing funds to illiquid assets.

- **The illiquidity premium can be over-stated.** In part, this arises from the impression given from examining gross returns without properly accounting for the impact of costs on realized returns. The evidence seems to suggest that the illiquidity risk premium component might average something like 0.5%-2%, where one exists. Additional returns might be available, but only to long-term investors that are less impacted by the implicit transaction costs that are reflected in prices. In any event, the 5%-8% additional returns to illiquid assets quoted in some studies seem unattainable.

---

47 Some of the spread may be explained by the credit risk premiums and allowance for the possibility of ratings transition. On the other hand, the default rate does not allow for recoveries, and hence over-estimates the expected loss from default. In any event, these factors can only explain a small portion of the variation in spreads.
**Return premiums associated with illiquidity can vary considerably across markets and time.** Illiquidity premiums can be observed in both equity and fixed income markets, although they may only be significant in certain segments and at certain times. Interestingly, no conclusive evidence has emerged that investors can access additional returns by choosing unlisted rather than listed assets in either property or infrastructure; although there is some evidence that additional returns may be available in private equity, where assets appear to be available at a discount to listed markets. The main message is that it should not be presumed that a premium always exists for illiquid assets.

**Valuation discounts or yield premiums contain valuable information.** The extent to which an illiquid asset sits at a valuation discount (or yield premium) to comparable liquid assets is directly linked to the compensation for both illiquidity risk and expected costs. Valuation measures hence provide a guide to the broad magnitude of the additional returns that may be available to a long-term investor in a market at a particular point in time.

It is worth reflecting on why illiquidity premiums might appear in equities and fixed income markets, yet not necessarily for unlisted property or infrastructure. We contend that the varying nature of the marginal investors in these markets may be an important influence. Equity and fixed interest investors typically demand and value greater liquidity. Meanwhile, investors operating in private markets may not do so to the same extent. Ang (2013) also argues along these lines, speculating that illiquidity premiums may vary across asset classes because they are priced like ‘silos’ reflecting institutional constraints, slow-moving capital and limits to arbitrage. He also suggests that illiquidity premiums may be small in some asset classes because they are populated with investors who overpay in chasing the illusion of higher returns; while equity and fixed income markets may be populated by risk-averse investors who pay for the privilege of being able to trade promptly.

Perhaps the most important take-away for long-term investors is that compensation offered for exposure to illiquidity can vary across markets and through time. This implies that a more selective approach towards investing in illiquid assets may be appropriate, rather than simply buying them on the presumption that an illiquidity premium exists. This insight plays to one of the real advantages held by long-term investors: discretion over trading. Long-term investors have the capacity to buy illiquid assets when the illiquidity premium is particularly high, without requiring an immediate return or relying on the capacity to exit any time soon. Conversely, they can consider selling when the return premium offered by illiquid assets diminishes. We now pursue this insight by examining dynamic strategies.
7. Dynamic Strategies: Concepts and a Basic Model

This section builds on the concepts raised in Section 6 to investigate how long-term investors might benefit from pursuing dynamic strategies that are well suited to illiquid assets. The particular strategy we examine involves timing both entry and exit to exploit fluctuations in prices or long-term expected returns that could arise from price pressures from short-term investors who need to trade. Effectively we depict a strategy which combines value investing with a form of liquidity provision. The strategy leverages off the two key indicators of a long-term investment horizon proposed in Paper 1: discretion over trading, and an investment approach that is focused on long-term value and returns. In addition, the strategy relates to one of the purported public benefits of long-term investors, being their capacity to act as a stabilizing force in the market. Hence we claim that there is both private and public benefit from fostering long-term investment with capacity to adopt strategies of the type being outlined. This section comprises three parts. Section 7(i) sets out the conceptual foundations of the strategy. Section 7(ii) then illustrates and investigates the fundamental tenets of the strategy under a basic two-period model. Section 7(iii) summarizes the key messages and acknowledges the shortcomings of our model.

(i) Conceptual Foundations

The capacity to identify variation in expected returns over time sits at the foundation of any dynamic strategy. Expected returns may fluctuate for either rational reasons (e.g. justifiable changes in risk aversion), or due to mispricing. Regardless of the reason, the aim is to maximize the long-term outcome by becoming more exposed to assets when they offer high returns (prices are low); and limit exposure when expected returns are low (prices are high). In this sense, dynamic strategies of the type being examined are aligned with value investing.

Such dynamic strategies involve a number of challenges. The first is estimating either expected long-term returns or long-term value, i.e. the level towards which markets are expected to revert. This is a critical and non-trivial task, and was discussed in Part A, Section 4(i). A further layer of complexity relates to how expected returns and/or prices might evolve in the future. If prices mean-revert due to either changes in expected returns or cash flows, it can crystallize and even amplify any payoffs from a position. Alternatively, if pricing moves to even more extreme levels in the initial instance, it would have been preferable to have held off on putting the position in place. While strategies of the type being examined ultimately anticipate mean reversion in expected returns and/or prices, it is still necessary to consider the path by which this occurs to maximize the outcome.

Illiquidity provides one possible source of fluctuations in expected returns and hence opportunities for long-term investors who are pursuing dynamic strategies. The motivation behind the dynamic strategy being addressed in this section is that a long-term investor can benefit from positioning themselves as the counterparty to those requiring liquidity. In other words, long-term investors may be able to dynamically capture the ‘transaction costs’ that others are willing to pay to secure a trade. The strategy might be encapsulated by: “If somebody is willing to sell at a low price, then buy from them. And if somebody else is willing to pay a high price to buy, then sell to them.”

Illiquidity may provide opportunities for long-term investors to trade at attractive prices in a number of ways. On one level, they can act as counterparty to another (short-term) investor that is keen to trade, thus ‘earning’ the market impact that the investor is willing to pay to secure a trade. The discussion in Section 6 implicitly assumed that transaction costs were paid by all investors. In doing so, it glossed over the fact that there must be somebody benefiting on the other side when market impact costs are involved. Being a ‘market maker’ or underwriter on specific transactions may assist at the margin. However, this is unlikely to be the primary motivation for pursuing a dynamic approach over the long term.

---

48 The idea of future changes in expected returns aligns with the concept of changes in the investment opportunity set and intertemporal hedging demand (see Merton, 1971; Campbell and Viceira, 1999).

49 The evolution of prices can reflect innovations in expected cash flows as well as expected returns. We skirt around this issue, notwithstanding the importance of the distinction.
Of greater importance is the possibility that the ruling market (mid) price for illiquid assets can move well out of alignment with long-term value. Illiquidity could play a role in two ways. First, overall price levels may be impacted by pressure from short-term investors responding to funding shifts. Second, fluctuations in the level of illiquidity and associated illiquidity risk may induce swings in the compensation required for illiquidity by the marginal investor. For instance, prices may be forced too high due to buying pressure from investors with money to spend, combined with a decrease in the required illiquidity premium due to the presence of ample liquidity in the market. Conversely, prices could be pushed too low due to pressure from forced sellers responding to loss of funding, combined with an increase in the required illiquidity premium in an environment where liquidity is highly valued. Another driver could be changes in the physical supply of assets. For instance, an increase in asset supply may notionally decrease the liquidity available to sellers, resulting in reduced prices and increased expected returns. The literature discussed in Section 6 provides evidence of swings in the illiquidity premium. Casual observation also suggests that these types of fluctuations are part of the fabric of market booms and busts.

The idea that funding shifts may create pricing pressure which induces mispricing has received attention in the academic literature. For instance, Brunnermeier and Pedersen (2008), as well as Vayanos and Woolley (2013), model circumstances where a shift in funding or fund flows can result in episodes of mispricing and over-shooting. Paper 1 cited a number of papers that provide empirical evidence of funding shifts having significant pricing effects, which can culminate in price reversals as well as underperformance by the managers involved (e.g. Coval and Stafford, 2007; Mitchell et al., 2007; Chen et al., 2010; Campbell at al. 2011; Khandania and Lo; 2011). Illiquidity also seems linked to mispricing. Sadka and Scherbina (2007) document such a link by investigating stocks with high analyst disagreement. Sadka (2006) finds a relation between momentum and post-earnings announcement drift anomalies, and fluctuations in illiquidity and associated risks.

There is also evidence that financial crises can play a role in mispricing or fluctuations in expected returns over time. Muir (2014) analyzes equity pricing and credit spreads around recessions, financial crises and wars across 14 countries over 140 years. He finds that price declines during financial crises can be largely explained by increases in expected returns, rather than decreases in cash flows; and that these declines are subsequently reversed. Although Muir does not directly examine the role of funding or illiquidity in these episodes, it seems likely that these would play a role.

Essentially, the combination of a need to trade and time-variation in the impact of illiquidity on investors with shorter horizons can provide opportunities for long-term investors to trade at attractive prices. Further, long-term investors may be able to best exploit these opportunities by pursuing a dynamic strategy that combines value investing with elements of liquidity provision.

Two ingredients are essential to capture the opportunities being considered, both reflecting the features which distinguish long-term investors, as discussed in Paper 1. First, discretion over trading is required not only in order to make an initial trade at the appropriate time, but also to allow time for positions to come to fruition. Strategies of the type being considered often involve going against the market, including acting in contradiction to evident buying or selling pressure, momentum and quite possibly consensus opinion. Immediate losses are a distinct possibility; and the timing of any payoff will be open-ended. Second, capacity to identify long-term value or estimate long-term expected return requires an investment approach that is focused on long-term value and its drivers.

(ii) Basic Model

This section presents a basic model of expected payoffs under a situation where a long-term investor pursues a dynamic strategy designed to exploit the opportunities arising from price pressure stemming from the actions of short-term investors. While the model grossly simplifies how such a strategy might be applied in practice, it nevertheless serves to capture and reflect its essence and properties. Under the model, a long-term investor maximizes the ‘long-term’ outcome over two periods, anticipating the possibility that asset prices may be pushed too high or too low by short-term investors during the first period. The investor has two strategies from which to choose. One is to hold the risky asset with the intention to sell if it becomes highly priced. The other is to hold cash (or some other liquid asset), with the intention to buy the risky asset if it becomes too
lowly priced, i.e. cash as an option.\textsuperscript{50} Our model indicates that a long-term investor can outperform relative to a buy and hold strategy by adopting a dynamic approach; and that some combination of the two dynamic strategies will often be optimal. In addition, short-term investors underperform on an asset-weighted basis because fund flows induce them to buy when asset prices are high and sell when they are low.

The main features of the model are as follows:

\textit{Basic Set-up}

- It is a two period model. An initial strategy is selected at the end of period 0, an action may be taken at the end of period 1, and the two-period outcomes are evaluated through to the end of period 2.

- There are two assets: a risky asset and a risk-free asset. Borrowing is not permitted. The risky asset is somewhat illiquid, so that its valuation (price/cash flow ratio) is responsive to price pressure.

\textit{Investors}

- There are two investor types: a long-term investor, and a population of short-term investors.

- The long-term investor may be thought of as investing a fixed endowment for two periods. They are concerned about the distribution of wealth at the end of period 2. Their aim is to choose the strategy that maximizes the Sharpe ratio over the two periods.\textsuperscript{51} The long-term investor chooses an initial allocation between the risky and risk-free assets in period 0, and anticipates the ability to trade at the end of period 1.

- Short-term investors might be thought of as comprising open-ended mutual funds that must invest all their available funds in the risky asset. They may receive fund inflows (or outflows) at the end of period 1, in which event they must buy (or sell).

- Fund flows received by short-term investors at the end of period 1 are specified as a function of the asset performance over period 1. The calibration assumes that the percentage inflow equals the excess return during period 1 (i.e. realized return less the discount rate). For instance, given a discount rate of 11%, a 31% return during period 1 would lead to inflows of 20% of funds as at end-period 1; while a return of -9% would lead to outflows equivalent to -20%.\textsuperscript{52}

\textit{Free Cash Flows}

- The risky asset generates (free) cash flows at the end of period 1 and period 2. Cash flows generated during period 1 are available for investment during period 2.

- The distribution of cash flows is the same in both periods, i.e. independent and identically distributed (iid). There are three possible cash flow outcomes during each period: above expectation (\textit{up}, +14\%), in line with expectation (\textit{expected}, +4\%) and below expectation (\textit{down}, -6\%).

- For the purposes of pricing and valuation, cash flows are expected to grow in perpetuity at their expected value, i.e. $g=4\%$.

\textsuperscript{50} The first strategy might be formally considered as a long position in the asset coupled with a perpetual ‘up and in’ barrier put option; while the second as holding cash plus a perpetual ‘down and in’ barrier call.

\textsuperscript{51} We check that the selected strategy also maximizes the utility of wealth in period 2, assuming a power utility function. We find that the optimal strategy can change with the assumed risk aversion coefficient.

\textsuperscript{52} The model contains no formal link from fund flows to performance, although the intuition is that they would be co-determined. Nevertheless, modeling flows as a direct function of realized return generates such a link, in effect, by ensuring that performance and flows move in conjunction. Modeling in this manner avoids a circular calculation; while arguably it matters little whether the starting point is taken as returns or flows.
Asset Prices and Valuation

- The risky asset is priced using a constant growth discounting model in each node by applying conditional discount rates and a standard growth rate (4%). Prices are converted into prospective price/cash flow multiples and cash flow yields for the purposes of presentation.

- Low, mid and high discount rates are specified conditionally in each cash flow node. This produces 9 nodes (3*3) for period 1, as well as 81 paths (3*3*3*3) across both period 1 and period 2.

- In specifying the conditional discount rates, a skew is assumed whereby the increase in the discount rates occurring in the lower part of the distribution exceeds the decrease in the discount rates occurring in the upper part. There are two reasons for this. First, it recognizes the non-linear price response to discount changes (i.e. greater impact from decreases than from increases). Second, it accords with the notion that sales due to outflows by short-term investors can have a larger impact than purchases following inflows (for supporting evidence, see Brennan et al., 2012 and Nagel, 2012).

- The return on the risk-free asset is 4% in each period.

Figure 5 details the key input assumptions for cash flows, discount rates and the corresponding price/cash flow multiples and cash flow yields. We apply standardized conditional probabilities of 40% in the central case and 30% in both the high and low cases with respect to both cash flows and discount rates. However, the assumed discount rates are skewed towards being somewhat higher relative to the average in the lower part of the distribution (see second last dot point above). The intersections of the cash flow and discount rate distributions are used to generate the distribution of risky asset prices and returns for period 1 and period 2. The last two columns in Figure 5 report the risky asset returns for period 1, and the associated fund flows encountered by short-term investors. The expected return for period 1 of around 10% is less than the discount rate due to the skew built into the discount rate. Nevertheless, the distribution of returns has a mild positive skew, reflecting non-linear effects arising from upward versus downward changes in the discount rate.53 Expected returns have a standard deviation of about 17%, which is approximately in line with equity-like investments. Flows range between about +30% and -32%, but the expected flow is near zero.

Figure 5: Two-Period Model of Dynamic Strategies – Key Assumptions

<table>
<thead>
<tr>
<th>State</th>
<th>Probability</th>
<th>CF % Growth</th>
<th>Discount Rate (DR) and Valuations</th>
<th>Returns &amp; Fund Flows, Period 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>State</td>
<td>Probability</td>
</tr>
<tr>
<td>Up</td>
<td>30%</td>
<td>14%</td>
<td>Low</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mid</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mid</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mid</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High</td>
<td>30%</td>
</tr>
<tr>
<td>Expected Value</td>
<td>4.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>4.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk-Free Rate</td>
<td>4.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Author estimates

53 If anything, our calibration is conservative to the extent that it fails to generate the negative skewness that is often observed in risky asset returns.
The same baseline cash flow and discount rate distributions are applied in both period 1 and period 2. An important point is that this structure generates mean reversion for the risky asset during period 2 in the following manner. Bear in mind that the risky asset must trade on a low, mid or high discount rate at the end period 2. Thus if the asset attains a low discount rate (i.e. is highly priced) at the end of period 1, it faces a 30% conditional probability of being valued using the same low discount rate at the end of period 2, and a 70% conditional probability of being valued using a higher discount rate. This induces a negative skew in period 2 for highly priced assets. Conversely, assets trading on high discount rates at the end of period 1 face a 70% conditional probability of being priced using a lower discount rate at the end of period 2. Thus a lowly priced asset faces a positive skew for period 2. This structure is in line with the intuition that once the valuation reaches some extreme, there is only one way to go if there is going to be a change. Nevertheless, mean reversion is by no means guaranteed under the model. A highly priced asset can still perform well and a lowly priced asset poorly during period 2 by virtue of cash flow realizations. Nevertheless, selling highly priced assets and buying lowly priced assets at the end of period 1 remains a ‘good bet’ under the model.

Having set out the structure of the model, we now examine various strategies. The baseline strategy involves buying the risky asset and holding it for both periods. We also estimate the outcome for short-term investors, allowing for the fact that they are required to trade in response to fund flows at the end of period 1. With respect to the dynamic strategies available to the long-term investor, Figure 6 provides a schematic of strategy ‘A’, which involves investing initially in the risky asset and then selling it at the end of period 1 if it is trading on a high price/cash flow (low discount rate). Figure 7 provides the comparable schematic for strategy ‘B’, which entails investing initially in cash and then buying the risky asset at the end of period 1 if it is trading on a low price/cash flow (high discount rate). We also evaluate a mixed strategy ‘C’, under which strategies A and B are combined in order to maximize the expected Sharpe ratio.
Figure 6: Schematic of Dynamic Strategy A – Invest in Asset, Cash Out End-Period 1 If Multiple High

<table>
<thead>
<tr>
<th>PERIOD 0: ACTION</th>
<th>PERIOD 1</th>
<th>END-PERIOD 1: ACTION</th>
<th>PERIOD 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash Flow</td>
<td>Price/CF</td>
<td>Prob</td>
<td>Return</td>
</tr>
<tr>
<td>Invest in Asset</td>
<td>16.0</td>
<td>12%</td>
<td>na</td>
</tr>
<tr>
<td>Cash Out</td>
<td>9%</td>
<td></td>
<td>na</td>
</tr>
<tr>
<td>4%</td>
<td>14.3</td>
<td>16%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>14.8</td>
<td>12%</td>
<td>Retain</td>
</tr>
<tr>
<td>14%</td>
<td>12.5</td>
<td>9%</td>
<td>Cash Out</td>
</tr>
<tr>
<td>16.7</td>
<td>9%</td>
<td></td>
<td>Retain</td>
</tr>
</tbody>
</table>

Expected Return (p.a.) 9.6% (100% in Asset)
Standard Deviation 16.7%

Source: Author estimates
Figure 7: Schematic of Dynamic Strategy B – Invest in Cash; Buy Asset End-Period 1 If Multiple Low

Figure 8 reports the expected two-period outcomes for the various strategies. The baseline strategy of buying and holding the risky asset over both periods provides a reference point. The buy and hold strategy delivers wealth in period 2 that is 21.9% greater than period 0 and has a standard deviation of 20.6%. Annualized these numbers indicates a change in wealth (i.e. ‘return’) of 10.4% pa and a standard deviation of 13.2% pa, equating to a Sharpe ratio of 0.49.

The short-term investor fares worse than the buy and hold strategy by about 1.2% pa. To see this, it is necessary to evaluate their performance on a money-weighted basis to account for the effect of fund flows at the end of period 1. This is reflected in the IRR reported in the last column of Figure 8. Note that short-term investors achieve the buy and hold return on a time-weighted basis, which is the usual way of reporting returns in the investment industry. Nevertheless, the IRR is notably lower than the buy and hold return as a consequence of the assumed relation between flows and realized returns during period 1. High realized returns attract inflows, yet reflect a move into highly-priced territory in certain states, which in turn signals low expected returns during period 2. Conversely, low realized returns attract outflows but can be associated with a move into lowly-priced territory and high returns in period 2. The upshot is that short-term investors have a tendency to add to their positions when prices are high, while selling when prices are low, which reduces their money-weighted returns. Our estimated impact of about -1.2% is in the same ballpark as Fiesen and Sapp (2007), who find that money-weighted returns are about 1.6% less than time-weighted returns for US equity mutual funds. Friesen and Sapp also provide support for the intuition underpinning our model. They find that the difference between money-weighted and time-weighted returns may be attributed to return-chasing.
behavior by mutual fund investors. It is also largely sourced from funds that are exposed to growth and momentum, rather than value.

**Figure 8: Outcomes over Two Periods**

<table>
<thead>
<tr>
<th>Investment Strategies</th>
<th>Wealth End-Period 2 (per $1)</th>
<th>Two-Period Change in Wealth (pa)</th>
<th>IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Standard Deviation</td>
<td>Skewness</td>
</tr>
<tr>
<td>Risk-Free Asset (Rf)</td>
<td>Rf</td>
<td>1.082</td>
<td>0.000</td>
</tr>
<tr>
<td>Risky Asset (A), Buy &amp; Hold</td>
<td>A</td>
<td>1.219</td>
<td>0.206</td>
</tr>
<tr>
<td>Short-Term Investor</td>
<td>A</td>
<td>1.220</td>
<td>0.160</td>
</tr>
</tbody>
</table>

**Dynamic Strategies:**

(A) Start with Risky Asset A 100% P/CF High => Rf

(B) Start with Risk-Free Asset Rf 100% P/CF Low => A

(C) Optimal Combination A 71%, P/CF High => Rf Rf 29%, P/CF Low => A

The first dynamic strategy (A) that a long-term investor may follow is to start fully invested in the risky asset, and then sell at end-period 1 if the asset becomes highly valued (i.e. priced on a low discount rate). Under our baseline assumptions, this is the strategy that maximizes expected wealth at the end of period 2. The strategy generates an expected change in wealth of 11.3% pa, with a standard deviation of 12.2% pa, indicating a Sharpe ratio of 0.60. This finding accords with the intuition that long-term investors have an opportunity to increase their returns while reducing risk through remaining fully invested until assets become over-priced (i.e. offer low expected returns), at which point they may sell out and move to a low risk alternative, such as cash.

Selling out when an asset becomes overvalued may sound an obvious thing to do. But it is often difficult to execute in practice for many institutional investors who face pressures to remain fully invested. For instance, divestment may be inconsistent with mandates, as institutions are often appointed to remain fully invested in a specific asset class or maintain a certain portfolio structure, e.g. a ‘70/30’ balanced fund. Peer group pressures can also induce funds to remain fully invested when markets are running hot. One of the benefits of being a long-term investor with full discretion over trading can be a greater capacity to sell out of highly priced assets, providing of course that organizational design accommodates and supports such a course of action.

The second dynamic strategy (B) entails starting by investing in the risk-free asset (i.e. cash), and then buying the risky asset at end-period 1 if it is lowly valued (i.e. priced on a high discount rate). Of all the strategies involving the risky asset, this offers the lowest expected change in wealth (8.3% pa), standard deviation (8.3% pa) and Sharpe ratio (0.36). The reason is that this strategy misses out on the relatively attractive expected return and Sharpe ratio offered by the risky asset on an unconditional basis, most notably including period 1. The implication is that holding cash as an option to take advantage of future opportunities arising from selling pressure may be unattractive as a stand-alone strategy for a long-term investor in many cases.

Nevertheless, a number of caveats need to be placed on the idea that holding cash as an option is unattractive. First, our model suggests that a long-term investor may find it optimal to hold aside some cash to take advantage of opportunities. We address this possibility in the next paragraph. Second, the attractiveness of holding cash as an option depends in part on risk aversion. Strategy B not only offers low risk, but is also positively skewed due to only investing in the risky asset when the upside potential well exceeds the downside risk. If the efficacy of the strategies is evaluated based on utility of wealth in period 2, rather than the Sharpe ratio, starting with cash, rather than the risky asset, becomes attractive at high risk aversion levels (specifically a coefficient of relative risk aversion of around 8). Third, the baseline results reflect the assumption that the risky asset is ‘fairly priced’ in period 0. The implication of altering this assumption is also investigated below.

To evaluate whether a mixed dynamic strategy may be optimal for the long-term investor, we solve for the combination of strategy A and B that maximizes the Sharpe ratio. The optimal combination under the baseline inputs is an initial investment of 71% in the risky asset and 29% in the risk-free asset. This combination...
delivers an expected change in wealth of 10.5% pa, a standard deviation of 10.2% pa and a Sharpe ratio of 0.63. Relative to the buy and hold strategy, the optimal combination delivers a slightly higher return at lower risk, and is also more positively skewed. This suggests that a long-term investor might benefit from partially committing their funds, holding some cash in reserve to put to work if opportunities arise as a consequence of sell-offs due to (say) price pressure from short-term investors. The result that some cash optimizes the Sharpe ratio is robust to changes in the cash flow and discount rate assumptions, including removal of the skew in discount rates, although clearly the magnitudes involved vary with the inputs.

Finally, we consider the impact of changing the initial pricing conditions for the risky asset. The baseline inputs assume that the risky asset is ‘fairly’ priced at period 0 in accordance with the constant growth discount model. Figure 9 plots the change in the initial risky asset weight that optimizes the Sharpe ratio for differing Price/Cash Flow multiples at period 0. It confirms that initial valuation conditions matter in discussing the extent to which one should be invested. Full initial commitment to the risky asset is indicated at a multiple of just below 12½-times. Full initial commitment to cash (the risk-free asset) is indicated at a multiple of just above 16-times. These multiples represent a spread of about ±12%-13% around the ‘fair’ multiple of 14.3-times under the valuation model using baseline inputs. The estimates suggest that partial commitment to a risky asset, coupled with some amount of cash held in reserve, may be an optimal strategy across a relatively wide range of situations. The key exception is when an asset approaches some valuation extreme.

**Figure 9: Optimal Risky Asset Weight for Period 1 vs. Valuation at Period 0**

Source: Author estimates
(iii) Summary

The discussion and basic model presented in this section establishes the following points:

- One of the key advantages faced by long-term investors with discretion over trading and an ability to identify long-term value is the scope to enhance returns through dynamic strategies aimed at exploiting time-varying expected returns, including any mispricing.

- Illiquidity presents a key potential source of time-varying expected returns, specifically fluctuations in the compensation required for illiquidity exposure, combined with price pressure from short-term investors required to trade in response to fund flows regardless of price. In this respect, the dynamic strategy may be considered a form of liquidity provision that aims to exploit the situation by taking the other side of the trade.

- Our basic model indicates potential for long-term investors to earn additional returns of perhaps 1% pa at the expense of short-term investors through pursuing such a strategy. Alternatively, the strategy might be viewed as providing scope to reduce risk. Either way, the risk/return trade-off is substantially enhanced.

- Our model suggests that it will often be optimal for a long-term investor to partially commit to a risky asset, while holding some cash in reserve as an option to take advantage of opportunities such as buying opportunities arising from sell-offs. One exception is when asset valuations sit towards some extreme (i.e. very high or low expected returns are on offer). In this event, full commitment to either cash or the asset might be warranted.

- Our model is a simplification of the real world. While we believe it captures the essence of the dynamic strategies that might be pursued by long-term investors, some of the important aspects that it fails to take into account are listed below:
  - **Uncertainty is likely to be higher in practice than portrayed in the model** – The model implicitly assumes that the probability distribution of payoffs and discount rates is known, when in practice they are typically estimated under considerable uncertainty (even Knightian uncertainty).
  - **The real world consists of more than just two periods of discrete length** – Investment is typically undertaken as a continuous pursuit, with investors monitoring and reacting to markets on an ongoing basis. Related issues include the following:
    - *The effectiveness of holding cash as an option partly relies on how soon an opportunity emerges* – Holding cash can have an opportunity cost if it takes a long while before low prices or high expected returns emerge. This issue will be highlighted and discussed in Section 8.
    - *Outcomes depend on the time period over which they accrue* – The model is based on the assumption that each period represents one year. Market adjustments occur in effect on variable timetables. In particular, if the market takes longer to readjust, the realized annualized returns would be attenuated. This is an important consideration for long-term investing, where the timing of payoffs can be open-ended and possibly manifest over a number of years.
  - **Menu of assets is wider than considered** – The model assumes two assets: a non-descript risky asset, and a risk-free asset. In practice, institutional investors have access to a wide range of assets.
  - **Implementation matters** – Our simple model ignores implementation issues such as the cost of running the strategy and the ability to transact.

With this background, Section 8 will now address the application of dynamic strategies in practice.

---

54 Consideration of dynamic strategies of the type examined here illustrates the substantial value of the free option to call up cash that can be available to funds operating in unlisted markets, such as private equity.
8. Dynamic Strategies: Practical Application

We now expand on the concepts and basic model of Section 7 in two ways. First, we identify practical issues to address when applying a dynamic strategy. Second, a basic dynamic strategy is illustrated using data from the Australian unlisted property market.

(i) Practical Issues

Recapping, the type of dynamic strategy considered here entails buying when long-term expected returns are high (prices are low) and selling when expected returns are low (prices are high), partly in anticipation of mean-reversion. Implementation of such strategies involves two main challenges. The first is estimation. Depending on how the strategy is designed, an estimate may be required of long-term expected return given current prices, as well as the mean reversion level for either expected returns and/or price, i.e. ‘fair value’. The mean reversion level provides both a benchmark against which an asset may be evaluated and a target for potential exit from a position.

The second challenge is identifying when to trade and at what price. This requires balancing the possibility of immediate mean reversion versus continuation towards even more extreme levels (often associated with momentum). The ideal would be to put in place positions once assets are near the extreme in expected return and/or price relative to the mean reversion level. With this in mind, the following issues arise in implementing this type of strategy in practice.

a) Estimation – It is by no means a trivial task to estimate long-term expected returns given current price, or the mean reversion level for expected returns and/or price. Challenges include forming assumptions about long-term or sustainable cash flows, uncertainty over the parameters for any pricing model, and even choosing the pricing model to use in the first place. Lack of data is often a hurdle to overcome. In some unlisted markets, the investor may be able to influence value themselves by adding economic value to the asset. In Section 4, we nominated estimation error as the most significant source of risk faced by long-term investors. Mis-estimation can lead investors to be attracted to a losing position, which they might potentially become locked into if the asset never appears to reach a level that justifies exiting the position (e.g. ‘value traps’ that keep underperforming despite looking cheap).

b) Signal to enter a position: identification of an extreme – As mentioned, the ideal is to enter a position as an asset approaches its extreme in expected return and/or price. The confidence interval for deviations from the mean reversion level will clearly be a point of focus (‘margin for error’), but is not the only consideration. The trade-off between the risk of missing out on opportunities versus moving too early may need to be evaluated. Non-price information might also be taken into account. For instance, there could be some influence acting on prices that may prove unsustainable over the long run. Examples include abnormal buying or selling pressure from funding shifts; swings in risk or uncertainty aversion; temporary mismatches in asset supply relative to demand; or extreme economic or monetary conditions that should not last. Long-term themes might also be relevant. In practice, it may be beneficial to develop heuristics or rules of thumb for entering (and exiting) positions that can be applied flexibly. This would permit other considerations to be incorporated as required, including the degree of confidence in the signal.

c) Signal to exit a position – Under the type of dynamic strategy being addressed, it is important that the exit decision is not a mirror image of the entry decision. Without asymmetry between the entry and exit criteria, net gains will be limited. For example, say the entry signal was when an asset was (say) 20% below fair value. A symmetric exit rule of closing the position when the asset crosses back over the 20% threshold would result in no net excess price gains, given the purchase and sale occur at the same level relative to fair value. Inherently, the type of dynamic strategy being addressed must rest on anticipation of

---

55 This could be modeled, or based on judgment. Another approach is to progressively build a position once trade region has been reached.
56 ‘Exit’ may be considered as returning to the long-term neutral position, whatever it may be.
57 This statement assumes that cash flow forecasts are correct, at least on average.
mean reversion. Accordingly, the exit signal should include the asset approaching, or perhaps crossing, the benchmark mean reversion level. Other non-price information might potentially be taken into account.

d) **Cash as an option and opportunity cost** – Section 7 raised the concept that holding some cash in anticipation of future opportunities might be optimal in many instances. Indeed, a prerequisite to take advantage of low prices or high expected returns is that funds are held aside.\(^{58}\) The problem with holding cash is that it involves an opportunity cost as long as the target asset continues to generate an adequate return. The practical implication is that the timing by which any opportunity is likely to emerge becomes a consideration. If an opportunity takes a long time to eventuate, then the opportunity cost of holding cash will likely be greater than if an opportunity unfolds soon. This complication was not drawn out in the basic model of Section 7, but will become evident in the analysis presented in Section 8(ii) below.

c) **Portfolio context** – Most of the discussion so far has focused on a two-asset choice between cash and a risky asset. In practice, investors hold portfolios of multiple assets, which may accommodate a multitude of dynamic strategies. One pertinent example for long-term investors is the ability to move funds between listed assets and their unlisted alternatives, such as listed and unlisted property, listed equity versus private equity, and so on.

e) **Capacity to sustain any position** – A critical issue is the capacity to sustain positions which have uncertain payoffs with open-ended timing. It is not unusual for dynamic strategies of the type being examined to incur initial losses and a slow turnaround: a point that will be illustrated by the analysis presented in Section 8(ii). Maintaining a position can require considerable individual and organization fortitude, often under imperfect information where self-belief is being questioned. This key point of vulnerability is discussed in Section 4.

f) **Implementation challenges** – Listed below are some implementation challenges for dynamic strategies. The analysis of Section 8(ii) will allow for transaction costs and implementation lags.

- **Costs and taxes**: Trading involves transaction costs, potentially including tax effects. Transaction costs are particularly important in illiquid and/or unlisted assets. The size of the holding can be relevant, as it may be more difficult and costly to trade in large parcels. There may be other costs associated with illiquid assets, including those related to liquidity management and capital commitments (see Section 6).

- **Implementation lags**: It can often take some time to implement a strategy, particularly where illiquid and/or unlisted assets are involved. Lags can stem from the time it takes to identify opportunities, search and evaluate potential investments, and then consummate a transaction.

- **Internal capability**: Opportunities may require an internal capability in order to identify, evaluate and manage them.

We now investigate some of the issues raised above by applying a dynamic strategy to representative data for Australian unlisted (i.e. direct) property.

(ii) **Application to Unlisted Property**

The analysis presented in this section illustrates the practical application of a dynamic strategy and the challenges involved. Our application generates trade signals from capitalization rates (i.e. yields) on Australian prime office property. The signal is applied by notionally investing in either unlisted property, cash, or some mix. The illiquid nature of unlisted property is recognized by assuming that trades occur at a lag and incur significant transaction costs. While not truly implementable, the analysis is instructive. It indicates that long-term investors could have benefited from the strategy relative to buying and holding unlisted property, albeit more through risk reduction than increased returns in this instance. It highlights the issues with applying such strategies in practice, including the possibility that they may underperform over short to medium horizons.

\(^{58}\) Funds need not be held aside in cash. They could be placed in another alternative asset that holds its relative value while the price of the target asset declines.
Our analysis draws on available data with some shortcomings. The capitalization rate series is a rough proxy. It reflects only prime CBD offices, and splices data from various sources. Prior to 1980 the series reflects only Sydney and Melbourne, to which a fixed adjustment (+0.44%) was applied to calibrate the levels. It then expands to capture an average of 4 capital cities until 2007, when a series with more comprehensive coverage is utilized. Returns to unlisted property are estimated based on the Mercer/IPD Australia Core Wholesale Property Fund Index and its predecessor, the Mercer Unlisted Property Index. This index reflects returns on broad-based unlisted property portfolios for a sample of Australian institutional investors, the constituents of which have been expanded over time. Accordingly, the capitalization rate and return series are not fully aligned, which may hamper the effectiveness of the signal. The cash return series is constructed from 90-day bank accepted bill yields. All data is quarterly.

Our application of the dynamic strategy reflects a combination of data constraints, guidance from the basic model of Section 7, sensitivity to practical implementation issues, and intuition. Details are described below and summarized in Figure 10. Shortcomings and issues will be discussed after the analysis is presented.

- **Neutral position** – The neutral position is invested 80% in unlisted property and 20% in cash. Inclusion of some cash reflects the basic model of Section 7, and tests the benefits of holding cash as an option. Results are reported for a neutral position of 100% unlisted property for contrast.

- **Entry signal** – The entry signal for adopting a ‘long’ position of 100% in unlisted property is once the capitalization rate crosses into the top quintile as estimated from data up to the decision point. Conversely, the signal for entering a ‘short’ position of 0% in unlisted property and 100% cash is once the capitalization rate crosses into the bottom quintile. The choice of quintiles as the cut-off is consistent with the intuition that an investor might require a confidence level in the order of 80% to adopt a non-neutral position. (We did not optimize the cut-off, but chose what seemed reasonable.)

- **Exit signal** – The signal for returning to the neutral position is once the capitalization rate crosses back over its median, as estimated from data up to the decision point.

- **Starting point** – We commenced the analysis with a neutral position in December 1990. This quarter was chosen as a point where the capitalization rate was in line with its historical median, so that neither the dynamic strategy nor the buy and hold strategy had an initial advantage.\(^{59}\)

- **Implementation** – The investor is assumed to hold an unlisted property portfolio that earns the same return as the Mercer/IPD property index. All trades incur a transaction cost of 6%\(^{60}\) of the value traded; and occur 4 quarters after the signal to trade is received. The lag makes allowance for the time it takes to locate properties and consummate trades. The lag works to the benefit of the strategy. This is neither entirely fortuitous, nor unreasonable. Unlisted property returns are highly persistent, in part due to the lagged adjustment of valuations under appraisal pricing.\(^{61}\) It is likely that lagged values better reflect ‘real’ market prices at which trades might occur, than values at the signal date. We assume that the portfolio is rebalanced to target weights only upon a trade.

- **Effective weightings** – The average weighting in unlisted property across all 102 quarterly periods is 76%. The strategy spends 76% of the time in neutral, 14% short and 10% long.

---

\(^{59}\) Results from the analysis are sensitive to the starting point.

\(^{60}\) A cost of 6% was suggested by the Future Fund’s property team.

\(^{61}\) The unlisted property return series has a serial correlation of 0.77 at a quarterly lag. We understand that, over much of the analysis period, some funds valued one quarter of their properties every quarter, while others valued the entire portfolio once a year. This implies a 3-4 quarter lag before all appraised values catch up with the market.
Figure 10: Summary of the Dynamic Strategy

<table>
<thead>
<tr>
<th></th>
<th>Portfolio Weight</th>
<th>Realized Portion of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unlisted Property</td>
<td>Cash</td>
</tr>
<tr>
<td>Targets:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long Position</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>Neutral</td>
<td>80%</td>
<td>20%</td>
</tr>
<tr>
<td>Short Position</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Realized Average</strong></td>
<td><strong>77%</strong></td>
<td><strong>23%</strong></td>
</tr>
<tr>
<td>Trading Rules</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go Long</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go Short</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Move back to Neutral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lag from Signal to Trade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transaction Cost - Property</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rebalancing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Author

Figure 11: Capitalization Rates for Australian Prime Office Property and Trade Points

Source: Jones Lang LaSalle, BIS Shrapnell, CBRE, author estimates
Figure 11 plots the capitalization rate series, along with the dynamically estimated median and upper and lower quintiles. Trade points incorporating the 4-quarter lag from the signal are identified with markers. The strategy undertakes two trades over 23 years. A long position is adopted in December 1993, following the property market collapse of the early-1990s. This episode fits the bill of a funding-driven, illiquidity event. The Australian property market was placed under considerable pressure at the time by a combination of bankruptcies by over-geared property investors, withdrawal of some banks from lending, and an overhang from the unlisted property trust sector that was suffering widespread requests for redemptions. The position was exited in March 1997. A short position was adopted in September 2007 and exited in December 2009, thus sitting out of the property market during the GFC. The property team of the Future Fund suggests that the reduction in capitalization rates prior to the GFC reflected a combination of capital flowing into the sector; ready credit availability with lower spreads and often light terms and covenants; and supportive growth in rents. This describes a situation where property valuations were being elevated by strong investor demand and abundant liquidity - also consistent with a role for liquidity effects in setting up trading opportunities for long-term investors.

Figure 12 tabulates the results. Figure 13 and Figure 14 compare the relative wealth indices for the strategy, a buy and hold in unlisted property, and cash. The strategy generates returns that are only modestly higher than the buy and hold strategy, by 0.06%-0.07% pa. Its main benefit is to significantly lower the volatility of wealth, especially over longer holding periods. For instance, the standard deviation of the change in wealth over 3-, 5- and 10-year rolling periods is 3%-4% pa less for the strategy than for the buy and hold. The strategy not only lowers volatility by investing in cash (23% average weighting), but also by being more selective when it commits to the property market. In particular, Figure 13 reveals that the strategy avoids the volatility of the GFC period. It is also less exposed during the sell-off during the early-1990s episode. While the strategy does not perform as well as cash during this earlier episode, it makes up for it later.

---

Figure 12: Outcomes Compared for Strategy vs. Buy and Hold and Cash

<table>
<thead>
<tr>
<th>Quarterly data over period:</th>
<th>Outcome for Each Investment</th>
<th>Strategy versus:</th>
<th>Note: Strategy with Neutral = 100% Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 1990 to December 2013</td>
<td>Strategy</td>
<td>Unlisted Property</td>
<td>Cash</td>
</tr>
<tr>
<td><strong>Compound Return</strong></td>
<td>7.10%</td>
<td>7.03%</td>
<td>5.67%</td>
</tr>
<tr>
<td><strong>Analysis of Change in Wealth:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mean (pa):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Over 1-quarter</td>
<td>7.15%</td>
<td>7.14%</td>
<td>5.68%</td>
</tr>
<tr>
<td>- Over rolling 4-quarters (1 year)</td>
<td>7.51%</td>
<td>7.69%</td>
<td>5.63%</td>
</tr>
<tr>
<td>- Over rolling 12-quarters (3 years)</td>
<td>8.18%</td>
<td>8.57%</td>
<td>5.60%</td>
</tr>
<tr>
<td>- Over rolling 20-quarters (5 years)</td>
<td>8.54%</td>
<td>8.95%</td>
<td>5.64%</td>
</tr>
<tr>
<td>- Over rolling 40-quarters (10 years)</td>
<td>9.09%</td>
<td>9.74%</td>
<td>5.56%</td>
</tr>
<tr>
<td><strong>Standard Deviation (pa):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Over 1-quarter</td>
<td>3.3%</td>
<td>4.5%</td>
<td>0.8%</td>
</tr>
<tr>
<td>- Over rolling 4-quarters (1 year)</td>
<td>5.2%</td>
<td>7.8%</td>
<td>1.4%</td>
</tr>
<tr>
<td>- Over rolling 12-quarters (3 years)</td>
<td>6.9%</td>
<td>10.1%</td>
<td>1.5%</td>
</tr>
<tr>
<td>- Over rolling 20-quarters (5 years)</td>
<td>7.7%</td>
<td>11.3%</td>
<td>1.7%</td>
</tr>
<tr>
<td>- Over rolling 40-quarters (10 years)</td>
<td>9.3%</td>
<td>13.3%</td>
<td>1.5%</td>
</tr>
<tr>
<td><strong>Portion of Time Underperforming:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Over 1-quarter</td>
<td>65%</td>
<td>21%</td>
<td>4%</td>
</tr>
<tr>
<td>- Over rolling 4-quarters (1 year)</td>
<td>72%</td>
<td>25%</td>
<td>8%</td>
</tr>
<tr>
<td>- Over rolling 12-quarters (3 years)</td>
<td>72%</td>
<td>16%</td>
<td>10%</td>
</tr>
<tr>
<td>- Over rolling 20-quarters (5 years)</td>
<td>63%</td>
<td>11%</td>
<td>8%</td>
</tr>
<tr>
<td>- Over rolling 40-quarters (10 years)</td>
<td>87%</td>
<td>6%</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Portion of Time Underperforming by more than -1% pa:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Over 1-quarter</td>
<td>30%</td>
<td>20%</td>
<td>4%</td>
</tr>
<tr>
<td>- Over rolling 4-quarters (1 year)</td>
<td>27%</td>
<td>19%</td>
<td>8%</td>
</tr>
<tr>
<td>- Over rolling 12-quarters (3 years)</td>
<td>20%</td>
<td>10%</td>
<td>9%</td>
</tr>
<tr>
<td>- Over rolling 20-quarters (5 years)</td>
<td>15%</td>
<td>10%</td>
<td>7%</td>
</tr>
<tr>
<td>- Over rolling 40-quarters (10 years)</td>
<td>13%</td>
<td>4%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Source: Mercer/IPD, author estimates

Figure 13: Wealth Indices (Log Scale)

![Wealth Indices (Log Scale)](image)

Source: Mercer/IPD, author estimates

Figure 14: Relative Wealth for Strategy

![Relative Wealth for Strategy](image)

Source: Mercer/IPD, author estimates
The analysis raises a number of issues with respect to the application of dynamic strategies by long-term investors:

- **Dynamic strategies can be a way to reduce risk as much as increase return** – A message that arises from both the basic model and the application to unlisted property is that dynamic strategies can reduce risk. Most notably, this is achieved by being willing to sell out of assets that offer low expected returns and/or are ‘overvalued’. As discussed earlier, the option to sell out is often only available to long-term investors with discretion over trading. Many short-term investors face pressure to be fully invested due to their mandates or concerns over relative performance versus a benchmark or peers.

- **Using cash as an option requires the time dimension to be considered** – Figure 14 depicts the concept that holding cash can entail an opportunity cost, which can accumulate the longer it takes for a buy opportunity to arise. The effect of holding 20% in cash while the property market delivers solid returns manifests as a gentle downtrend in the relative wealth generated by the strategy versus unlisted property between March 1996 and September 2007, and again after December 2009. Indeed, a neutral position of 100% invested (the equivalent of Strategy A in Section 7) seems to generate a better result for the data set. Nevertheless, this does not rule out the possibility that holding cash as an option may be worthwhile under certain circumstances. Rather, it illustrates the importance of evaluating the likelihood of an opportunity to buy arising within a reasonable period of time when implementing this type of dynamic strategy.

- **Dynamic strategies may entail short-term performance risk** – The analysis provides an indication of how dynamic strategies may underperform some benchmark, possibly often and for extended periods. Figure 12 reports the portion of time that the strategy underperforms unlisted property and cash across various horizons. Over 1-year rolling periods, the strategy underperforms unlisted property 72% of the time, as well as underperforming by more than -1% during 26% of the time. It also underperforms cash 25% of the time over 1-year periods. While the time spent underperforming reduces with horizon, it remains meaningful even over 5-10 year periods. The full benefits only become evident over the entire life of the strategy (i.e. the very long term). This confirms the extent to which such strategies are only suitable for long-term investors that are unconcerned with the risk of short to medium term underperformance.

- **The strategy might be improved by incorporating other information** – The strategy as applied here may understate the potential benefits to a long-term investor by basing the trade signal on one narrow indicator - the capitalization rate for office property. This issue extends well beyond relying on an imprecise series that is mismatched with the return series, and the uncertainty this adds in identifying extreme price points. Such a simple signal ignores other relevant information that may be available to a long-term investor. In particular, estimation of long-term fair value and/or expected return may be improved by considering the outlook for long-term cash flows. Incorporating such information would focus the investment approach towards long-term drivers of value and expected returns, which aligns with the second indicator of long-term investment, as identified in Paper 1. In addition, long-term investors might take into account other evidence that pricing is at an unsustainable extreme in generating trade signals, as discussed in Section 8(i). For instance, a long position might be confirmed and encouraged if capitalization rates at the high end of the range were accompanied by evidence of price pressure from forced sellers.

- **Asset universe to which the dynamic strategy is applied** – Long-term investors face a wide menu of assets to which dynamic strategies might be applied. In particular, only long-term investors are well placed to pursue dynamic strategies involving illiquid and/or unlisted assets. Further, dynamic strategies could be conducted in a broader portfolio context, involving other assets apart from cash. Another risky asset with a lower opportunity cost than cash might be used as the alternative asset. In the context of property markets, considering listed property (REITs) as a third choice in addition to cash is only likely to enhance the potential outcome.

---

63 The capitalization rate series was relatively stationary over the analysis period, which was beneficial to the strategy. If the trade analysis is commenced earlier using the same rules, the results deteriorate considerably. This serves as a warning regarding the difficulties associated with estimation when data is limited, as is often the case.
In summary, long-term investors have the capability to adopt dynamic strategies which may not be suitable for short-term investors due to the nature of the payoff timing, the requirement for discretion over trading, and the need for a keen perspective on long-term drivers of returns or value to implement effectively. Our analysis illustrates the potential benefits from dynamic strategies, including the scope to reduce risk, as well as potentially increase returns, over the long term. Indeed, our analysis probably understates the potential benefits because it is based on more limited information and a narrower asset opportunity set than might be available in practice.
References for Paper 2


Synopsis

We address how investment management organizations might be built to successfully pursue long-term investing. A variety of recommendations and suggestions are put forward that address four building blocks: organizational; incentives; investment approach; and discretion over trading. A key message is the need to manage the principal-agency issues that occur across multi-layered operations, with the aim of building alignment with investing for the long run. Investment approaches should be focused around the drivers of long-term outcomes, rather than short-term price movements. We highlight the importance of commitment in terms of both funding, and towards those making the investment decisions; but note how commitment is associated with costs and trade-offs. An approach is presented for evaluating performance based on separating out the effects of long-term expected returns, changes in discount rates, and changes in expected long-term cash flows. Our discussions are illuminated by insights and examples drawn from the Future Fund.

Acknowledgements: The author would thank in particular Stephen Gilmore, Will Hetherton and Nigel Wilkin-Smith, who formed the advisory team from the Future Fund for this project. The following are also thanked for their helpful input: Syd Bone, Paul Brunker, Joe Cheung, Doug Foster David Gallagher, Tim Gapes, Jack Gray, Graham Harman, Brad Holzberger, David Iverson, Anthony Lane, Damian Lillicrap, and David Neal.
1. Introduction

This is the final paper in a series examining long-term investing from an institutional investor perspective. Long-term investors have access to a broader range of investment strategies, many of which relate to opportunities that stem from the actions or aversions of the shorter-term investors that can dominate markets. We address how to design an investment organization so it might successfully pursue these opportunities. The recommendations and suggestions that we put forward draw on an appreciation for the influences on investment horizon, ideas appearing in the literature, the experience of the Future Fund, and a dollop of creative thinking. The first paper (Warren, 2014a; ‘Paper 1’) examines the nature and determinants of investment horizon, as well as the debate on short-termism versus long-term investing. The second paper (Warren, 2014b; ‘Paper 2’) outlines the benefits and pitfalls of long-term investing, highlighting the advantages held by long-term investors and investment strategies that they might pursue.

Our approach is to propose four building blocks that an institutional investor should address in pursuing long-term investing. These building blocks provide a structure under which practical recommendations and suggestions are offered. They are:

(i) **Orient the organization** through building alignment with investing for the long term, supported by appropriate organizational settings and features.

(ii) **Set the right incentives**, such that progression towards achieving long-term objectives becomes what is measured and rewarded, and short-term outcomes are viewed as markers not destinations.

(iii) **Establish a long-term investment approach** which sets the sights squarely on the drivers of long-term outcomes, such as long-term value and/or returns; while filtering out the short-term noise.

(iv) **Harbour discretion over trading** by establishing fund structures that mitigate the risk of needing to trade purely due to fluctuations in funding or other influences.

Addressing all four building blocks should create an environment where attention is directed towards generating long-term outcomes, and the pressure to deliver short-term performance is limited. The building blocks provide a structure that not only underpins our recommendations and related discussions. They also amount to a checklist that might be used by fund boards and executives who are looking to foster long-term investing within their own organizations. While we make no public policy recommendations, policy makers may too find it useful to think in these terms if they want to promote a larger cohort of long-term investors operating within financial markets.

The central element of the first building block – **orienting the organization** – is to address the principal-agency relations that occur along the chain of delegations existing within multi-layered investment organizations. A key objective is to **build alignment** with investing for the long term. This alignment should ideally extend from end-investors and other stakeholders, through to the governing board, to internal management, and finally to external providers, such as investment managers. Alignment might be built through a process whereby the benefit of long-term investing is initially sold, expectations are managed, and then engagement and explanation occurs along the way. Organizational settings and features should be configured accordingly, including: guiding principles; culture; trust; governance and decision structures; the type of people involved, as

---

64 The Future Fund is Australia’s sovereign wealth fund, and was established in 2006 as a reserve to help offset the unfunded defined benefit pension liabilities of the Federal Government. With the exception of operating costs, the Future Fund Act (2006) prohibits withdrawal from the Fund before 2020 unless its balance exceeds the target asset level as specified under the Act in the interim. The Board of Guardians is also responsible for managing three Nation Building Funds – the Building Australia Fund (BAF), the Education Investment Fund (EIF), and the Health and Hospitals Fund (HHF) – and has been nominated to manage funds designated for the Disability Care Australia Fund, which is designed to provision for liabilities accruing to the National Disability Insurance Scheme. Furthermore, subject to legislative approval, the Board and Agency have been nominated to manage any funds designated for the Medical Research Future Fund (to include the remaining balance of the HHF) and Asset Recycling Fund (to comprise the remaining balances of the BAF and the EIF).
well as their tenure; and the basis of collaboration with any external managers. The aim is to create an environment where everybody concerned thinks and acts in terms of long-term outcomes.

The second building block – setting the right incentives – may be considered an important sub-feature of orienting the organization. Well-structured incentives can reinforce alignment, although they may not drive it in their own right. Desirable attributes include: co-investment where feasible; use of subjective bonus components as a tool to reinforce desired behaviours; de-emphasizing relative performance measures; and focusing evaluations on progress towards achieving long-term goals. In line with the latter, Appendix B presents an approach for evaluating performance that involves attributing returns into three components: initial expected return, changes in discount rates, and changes in expected long-term cash flows. The approach emphasizes the accuracy of long-term cash flow forecasts in performance evaluation; and aligns with a decision framework where assets are selected based on projected long-term expected returns. We also discuss extending the term over which performance remuneration is paid. Arrangements of particular interest involve accruing bonuses over shorter periods, which are then paid over an extended period conditional on subsequent outcomes. We put forward an idea for ‘performance bonds’, which vest conditionally on performance being sustained.

With the third building block – establishing a long-term investment approach – we avoid making prescriptive recommendations, as there exists a wide variety of investment philosophies and processes that might be considered to be long term. Nonetheless, the crucial element is adopting an approach that looks beyond the short term, towards the drivers of long-term outcomes. In many cases, this will involve focusing on long-term cash flows and expected returns, rather than short-term price fluctuations (see Paper 1). It may also entail identifying the path that maximizes long-term outcomes under a dynamic strategy. In any event, an ingrained focus on the long term is fundamental. We also note how long-term investors may perceive risk differently; for instance as shortfall versus long-term objectives, or permanent loss of value. A detailed account of the investment process of the Future Fund appears in Appendix C.

The fourth building block – harbouring discretion over trading – will be subject to varying levels of control across investors. For those with latitude to shape their funding arrangements, we put forward some suggestions to enhance security of funding. The strongest action is to offer products where funding is locked in. Two solutions include making use of closed-end vehicles; and providing investors with the ability to opt-out of their right to redeem on a voluntary basis. Other weaker actions include establishing the capacity to defer redemption (e.g. gates), and raising switching costs.

We also highlight the importance of commitment in fostering long-term investing. Commitment matters in two ways. First, commitment of funding underpins discretion over trading. Second, commitment to investment managers provides the confidence and encouragement to pursue long-term investment strategies. (Note: We use the term ‘manager’ in a general sense, as those responsible for making investment decisions and building portfolios, be they either internal or external to the organization.) To give the best chance of accessing the benefits of long-term investing, the threat should be minimized that the ‘principal’ might withdraw support through either removing funding, or holding the ‘agent’ to account for poor short-term performance. Rather, they should stand back and allow time for investments to come to fruition. This requires placing trust in the manager to deliver. However, commitment involves costs in the form of loss of liquidity, and heightened reliance on the manager and hence exposure to agency risk. These costs imply the existence of trade-offs. They also heighten the importance of designing the organization to manage agency issues and deliver security of funding as far as possible.

The paper is arranged as follows. In Section 2, we reinterpret the determinants of investment horizon that were identified in Paper 1, refocusing them towards the four building blocks. Section 2 also discusses commitment. In Section 3, we briefly recognize the ideas for fostering long-term investing that appear in the literature. Those seeking more detail on these ideas should refer to Appendix A. Section 4 translates the four building blocks into our recommendations and suggestions. Concluding comments appear in Section 5. Appendix B details the approach to performance evaluation based around attributing returns into three components. Appendix C describes the investment process of the Future Fund.
2. Determinants of Investment Horizon – A Reinterpretation

In this section, we build a bridge from the discussion of the determinants of investment horizon appearing in Paper 1, to our recommendations and suggestions. The determinants of investment horizon are distilled down to the four building blocks that should be addressed in designing an investment organization to pursue long-term investing. Figure 1 lists the twelve influences on investment horizon which we have drawn from the academic, industry and public policy literature and discuss at length in Paper 1. The extent to which each influence is controllable by an investor is noted. Controllable influences can be broadly arranged into four groups, giving rise to our building blocks. Two relate to discretion over trading and investment approach, which reflect the ‘indicators’ (i.e. characteristics, or markers) of a long-term investor, as proposed in Paper 1. The other two relate to organizational settings and incentives. While the latter two building blocks are closely related, we consider incentives as sufficiently important to be discussed in their own right.

Figure 1: Twelve Influences on Investment Horizon – A Reinterpretation

<table>
<thead>
<tr>
<th>Influences:</th>
<th>Controllable By Investors?</th>
<th>Building Block To Which Most Related:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Related to investor circumstances:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) Nature of funding or liabilities</td>
<td>Sometimes</td>
<td>Discretion Over Trading</td>
</tr>
<tr>
<td>(ii) Trade discretion and tolerance for illiquidity</td>
<td>Sometimes</td>
<td>Discretion Over Trading</td>
</tr>
<tr>
<td>Related to design of investing environment:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iii) Organizational structures</td>
<td>Yes</td>
<td>Organizational</td>
</tr>
<tr>
<td>(iv) Performance evaluation and remuneration practices</td>
<td>Yes</td>
<td>Incentives</td>
</tr>
<tr>
<td>(v) Financial market structures and financial liberation</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Related to investor choice:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(vi) Investment philosophy and process</td>
<td>Yes</td>
<td>Investment Approach</td>
</tr>
<tr>
<td>(vii) Information sets employed</td>
<td>Yes</td>
<td>Investment Approach</td>
</tr>
<tr>
<td>(viii) Behavioural effects</td>
<td>(Mitigate)</td>
<td>Organizational</td>
</tr>
<tr>
<td>(ix) Decision-maker attributes</td>
<td>Yes</td>
<td>Organizational</td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(x) Cultural</td>
<td>In Part</td>
<td>Organizational</td>
</tr>
<tr>
<td>(xi) Limits to arbitrage</td>
<td>(For Noting)</td>
<td></td>
</tr>
<tr>
<td>(xii) Diversification via alternative assets (push factor)</td>
<td>(For Noting)</td>
<td></td>
</tr>
</tbody>
</table>

Below we give an account of how our building blocks relate to the influences on investment horizon, as listed in Figure 1. As overlap exists, these building blocks provide a somewhat loose structure.

A) Organizational – Many of the influences on investment horizon relate to the organizational context within which investment decisions are made. As we discuss later, the management of principal-agent relationships is central. Organizations should be structured (item iii in Figure 1) to provide investment managers – both internal and external – with the license, support and incentive to pursue long-term investing. Long-term investing becomes harder to sustain if managers feel that they may not be backed in their efforts, or if organizational support crumbles when times get tough. The related discussion in Paper 1 identifies some of the organizational features that are conducive to longer horizons. They include: alignment throughout the decision chain; use of closed-end structures (overlap with item i); the manner in which behavioural effects are addressed (item viii); the type of people employed (item ix); and culture (item x).
B) **Incentives** – Decision makers must be able to pursue long-term investing in the expectation of being rewarded for doing so; and not be subject to the fear of potentially being punished if results are not immediately forthcoming. To a large extent, this will reflect the formal process of performance evaluation and remuneration (item iv). However, incentives go beyond just numerical measures and bonuses. Other features that matter include what is rewarded in terms of personal careers (including status); and what is viewed as ‘success’ or ‘failure’ within the organization (item iii). What is expected and acknowledged by the broader financial community can also have sway (items v, x); although this can be difficult for an individual organization\(^{65}\) to influence.

C) **Investment approach** – The influences related to investment approach are mostly grouped under investor choice in Figure 1, and hence sit within the realm of what is controllable by the investor or investment organization. They include: the chosen investment philosophy and process (item vi); the information employed (item vii); and potentially the type of person making decisions (item ix). Behavioural influences (item viii) are also relevant in the sense that they may create barriers to sustaining a long-term perspective, and should be addressed accordingly. Overall, the aim is to build a process for making investment decisions that sets the sights towards the long term, and avoids being distracted by short-term developments.

D) **Discretion over trading** – Having discretion over trading (item ii) means that an investment manager is left unfettered in their pursuit of long-term investing. They are able to choose when they trade and at what price, without having to deal with external pressure, such as funding shifts. Discretion over trading is closely aligned with tolerance for illiquidity (see Paper 2), which underpins access to a broader range of investments, including unlisted assets. The nature of funding and liabilities (item i) is integral. Indeed, it may stipulate if an investor can even pursue long-term investing. Whether funding, and hence discretion over trading, are controllable depends on the circumstances. Long-term investing may be inadvisable or even impossible where there is an unavoidable undertaking to satisfy any claims at short notice, e.g. short-tail insurance; or products which investors may buy in part for liquidity, such as open-ended funds. In other situations, there might be latitude to design funding arrangements to protect discretion over trading, and henceforth engender a long-term approach.

We translate these insights into concrete recommendations and suggestions for investment management organizations in Section 4. Before doing so, we address two other issues. Immediately below we discuss the role of commitment. In Section 3, we briefly recognize the ideas for fostering long-term investing that appear in the literature.

## Commitment and Trade-offs in Long-Term Investing

Successful pursuit of long-term investing requires commitment. However, commitment entails costs, henceforth giving rise to trade-offs. There are two main aspects:

- **a)** Commitment of funding is required to deliver discretion over trading. However, committing funds involves the cost that liquidity is reduced, if not forfeited.

- **b)** Commitment to investment managers (both internal and external) is needed in order for them to feel they have the license and support to execute long-term investment strategies. The manager must be confident that investments will be given ample time to come to fruition; and that they will not be called to account for failure to deliver over shorter horizons. However, the cost of committing to a manager is heightened exposure to agency risk. Providing a manager with enough rope places reliance on ‘trust’, and increases the dependence on the manager. It will often be difficult to distinguish between short-term underperformance that is attributable to a failure of investment strategy or its implementation, and hence the manager; or if the payoff has merely been deferred. These two eventualities are observationally equivalent; and distinguishing one from the other can be hampered by information asymmetry. Indeed, it is only possible to know if a long-term investment has actually worked over the long term.

---

\(^{65}\) Funds might be able to exert considerable influence by acting collectively.
The essence of the trade-off might be summed up as follows. The positive side of greater commitment is that it increases the chances of capturing the potential benefits of long-term investing. The negative side relates to the risk of becoming locked into a poor manager who makes errors that might only be fully revealed when it is too late.

Regarding this trade-off, substantial sections of the investment management industry seem configured for low commitment. Provision of immediate liquidity to investors is prevalent. There is wide use of open-ended structures offering redemption-at-call, e.g. member choice with 3-day portability in the Australian superannuation system. Commitment to managers is limited. Managers are often evaluated and rewarded on short-term performance, with little evidence of tolerance for underperformance extending beyond 2-3 years. Of course, the approach commonly seen in the investment industry does have certain benefits, including wide-ranging access to liquidity and close accountability for managers. However, this helps to breed short-term behaviours which can potentially have their own costs. These are discussed in Paper 1, and include: greater market inefficiency; excess volatility; procyclicality; less effective corporate monitoring; and less efficient intermediation due to additional costs. Provision of immediate liquidity has been shown to lead to lower returns, with some estimates placing the impost in excess of 1% pa (for example, see Edelen, 1999; Johnson, 2004). Further, discouraging long-term investing may itself entail an opportunity cost.

Nevertheless, we are talking about a trade-off. This suggests the need to choose a position along a spectrum. There are varying degrees of commitment. With respect to funding, partial solutions may be available such as commitment for defined periods, or the ability to defer redemptions under certain circumstances. We explore some related ideas later in this paper. Unconditional commitment to managers for the long term may not be necessary. There may be ways of evaluating the skill of a manager in implementing a long-term investment program, other than just monitoring the flow of returns. We also explore some ideas along these lines. Another interesting case is closed-end fund structures, which can secure commitment of funding from the manager’s perspective while retaining liquidity for end-investors if a secondary market exists. However, as discussed by Stein (2005), closed-end funds do not solve the agency risk related to commitment to the manager. Indeed, agency risk may be exacerbated to the extent that mechanisms for disciplining the manager are weakened under closed-end structures.

Finally, long-term investing is subject to a number of potential pitfalls. These were discussed in Paper 2, and include:

- **Potential errors** – Long-term investing is exposed to errors in forming expectations about the long term, particularly mis-estimation of long-term value or expected returns. Scope for error is heightening by the difficulty of predicting the distant future.
- **Organizational, agency and alignment issues** – Key points of vulnerability relate to organizational and agency issues, including the need for alignment and a reliance on commitment and fortitude. Many of the recommendations and suggestions in this paper are aimed at addressing these vulnerabilities.
- **Constraints** – These may include constraints on the capacity to respond to opportunities; the notion that some strategies may be mutually exclusive; lack of access to shorting or leverage; and impacts on the portfolio arising from the cash flow effects of currency hedging.

Long-term investing is not all a one-way street. It involves costs and trade-offs. There are pitfalls to avoid. The challenge is to identify and manage towards a position that best suits the institutional investor in question, and provides the greatest prospect of success.

---

66 The global trend towards in-house management by large institutions might be interpreted as increasing the commitment to managers.

67 Private equity provides an example of commitment of funding over longer horizons (typically of 10 years or more); but also highlights the associated reliance on the manager and the consequent exposure to agency risk.
3. Ideas from the Literature

Before we put forward our own recommendations and suggestions, we recognize the many ideas for fostering long-term investing appearing in the literature. The literature contains various interesting and useful suggestions, some of which we draw on ourselves. Figure 2 lists sixteen categories of ideas. An overview of each may be found in Appendix A. The literature we summarize covers ideas for both the design of investment organizations and public policy recommendations; although we do not consider the latter in this paper. Figure A1 in Appendix A also categorizes each idea in terms of its relation to either our building blocks or public policy.

Figure 2: Sixteen Ideas for Extending Investment Horizons

(i) Engineer the organization towards long-term investing
(ii) Orient investment mandates towards the long term
(iii) Improve manager transparency and engagement with investors
(iv) Apply ideas from behavioural and organizational change theory
(v) Employ the right people
(vi) Alter how performance is evaluated
(vii) Align remuneration structures
(viii) Use co-investment
(ix) Exploit commitment mechanisms
(x) Raise switching costs
(xi) Increase information on long-term value drivers
(xii) Issue industry practice guidance
(xiii) Re-jig the regulation and policy framework
(xiv) Education
(xv) Reward long-term holders
(xvi) Impose penalties for excess trading

The above list of ideas lacks a unifying theory or framework (much like the determinants and benefits of long-term investing that are covered in Paper 1 and Paper 2, respectively). Part of our contribution is to provide a structure under which the main issues can be identified and tackled. This appears in the form of our four building blocks, which we have linked to the influences on investment horizon.
4. Building Investment Organizations with Longer Horizons

We now present our recommendations and suggestions for how an institutional investment organization might be designed to successfully pursue long-term investing. Our discussion is arranged in four subsections, each dealing with the building blocks that were identified in Section 2. The building blocks should be viewed as an integrated and at times overlapping set, and not as independent items. All four should be addressed in unison. A roadmap for this section appears in Figure 3. In putting forward our recommendations and suggestions, we attempt to acknowledge any ideas proposed by other commentators. Our apologies to anybody we have inadvertently failed to acknowledge.

Figure 3: Roadmap of Our Recommendations and Suggestions

<table>
<thead>
<tr>
<th>Building Block</th>
<th>Recommendations and Suggestions</th>
</tr>
</thead>
</table>
| (i) Organizational | Key element: Manage principal-agency issues  
Specific areas to address:  
(a) Strategies for building alignment  
(b) Guiding principles (mission, etc.)  
(c) Culture  
(d) Trust  
(e) Governance and decision structures:  
- Long-term objectives  
- Manage temporal trade-offs  
- Framing and presentation  
- Resist myopic loss aversion  
(f) People  
(g) Collaboration with external managers |
| (ii) Incentives | Key element: Reward progression towards long-term objectives  
(a) Direct and co-investment ('skin in the game')  
(b) Subjective components  
(c) Measuring performance:  
- De-emphasize relative performance  
- Focus on progress towards the ultimate goal  
- Three component attribution  
(d) Performance remuneration  
- Lengthen horizons as feasible  
- Performance bonds |
| (iii) Investment Approach | Key element: Focus on long-term outcomes  
(It is inappropriate to be prescriptive; although some potential differences in focus of long-term versus short-term investors are presented in Figure 4.) |
| (iv) Discretion over Trading | Key element: Mitigate the possibility of being forced to trade  
Strong  
(a) Closed-end fund structures  
(b) Redemption opt-outs  
Weak:  
(c) Redemption deferrals  
(d) Switching costs |
Orienting the Organization

We consider organizational characteristics as fundamental for creating an environment within which long-term investing can flourish. The objective is to build long-term investing into the organizational DNA, so that everybody concerned thinks and acts in terms of long-term outcomes. Long-term investing should be considered by all as ‘what we do’. This would be reinforced by incentive structures and manifest in the investment approach, which are our second and third building blocks. In this sub-section, we identify and discuss the key components of organizational design for orienting an investment organization towards the long term.

Managing various principal-agent issues is a central element: the goal should be to secure alignment with a long-term approach to investing from top-to-bottom. Most investment organizations are multi-layered. There can be many steps in the chain of delegation, extending from end-investors or other stakeholders; to the governing board or equivalent; to internal management (itself potentially with multiple levels); down to providers, including external investment managers. Each of these links entails a principal-agent relationship which needs to be managed. The challenge is to ensure all involved have a shared understanding of the mission; and are aligned in terms of principles, objectives, broad strategy, and how success is identified.

A key problem with long-term investing is investment outcomes can take a long time to become apparent. Nevertheless, ‘agents’ will inevitably be monitored and evaluated in the interim by the ‘principals’ that appoint them. It is important to avoid the flow of short-term results becoming the focus of monitoring and evaluation. Failing to do so can result in the agents pursuing short-term results, to the detriment of investing for the long term. Many of the suggestions appearing below are designed to reduce the risk of this occurring, by diluting the focus on short-term results and placing them in proper context. A key component is to build an understanding of investment decisions, and how they relate to actions taken and outcomes observed.

(a) Strategies for Building Alignment

Given the importance of alignment across all levels of the organization, we start with broad strategies for building alignment around long-term investing. There is one overarching recommendation: communicate. This could come in many forms: published materials, face-to-face presentations, and direct conversations between principals and agents. Key messages should be repeated often. While communication is important, pitching it correctly is a challenging task. Communicating too much information or too complex a message may cause confusion, and potentially undermine the additional credibility and trust it is intended to engender. The need to protect any competitive advantage can impose limits on what is prudent to disclose. There is a delicate balance to be found.

A foundation for alignment might be established through the following three steps:

Step 1: Sell the benefit – Convincing all stakeholders of the benefit of being a long-term investor is a good initial step towards building alignment. For instance, WEF (2011) and ISA (2014) call for promoting long-term investing, both in general and with regard to particular investments. Paper 2 specifically addresses the benefits of long-term investing, and may provide some ammunition. Mental time travel techniques (see Irving, 2009) may be useful in selling the benefit, and would suggest focusing the organizational vision towards long-term outcomes.

Step 2: Manage expectations – It is important to manage expectations about what long-term investing can and can’t achieve, in particular noting the potential pitfalls (see Paper 2) and the trade-offs (discussed above in Section 2). It is critical to gain acceptance that results may not be immediately forthcoming, and that patience is required. One aim is to ensure that support for long-term investing can withstand not only initial underperformance, but also any implementation errors. When mistakes are made, the reaction should be to learn and adjust, rather than discard a long-term approach altogether.

Step 3: Engage and explain along the way – Many commentators emphasize the significance of transparency and engagement with stakeholders: see point (iii) in Appendix A for a discussion. For example, Kay (2012) and Ambachtsheer et al. (2013) suggest that greater transparency helps engender trust (discussed under
point (d) below). Mercer (2010) alludes to the need to be clear about investment horizon. There are also numerous calls for greater disclosure and accountability. Engaging and explaining is particularly relevant for long-term investing because the positions and strategies involved can be long in duration, opaque in nature, and uncertain in timing. In such situations, the best way to keep stakeholders on board is to explain the reasons for an investment and its progression. Affinity is built through understanding. The payoff is that stakeholders and the various principals in the chain of delegation should become less likely to monitor and judge agents purely on the flow of visible outcomes such as returns, and more likely to retain commitment.

The task of building alignment involves *lessening the distance from the decision making*. A number of commentators refer to a ‘lengthening of the chain’ between beneficial owners and those making the investment decisions as helping to foster a short-term culture (see WEF, 2011; Kay, 2012; and other authors cited in Paper 1, Section 4(v)). Distance encourages the monitoring and evaluation of agents based on the visible flow of short-term results. Accordingly, it is particularly important to build relationships based on *trust and understanding*, both across the chain of delegations and at the various links in the chain. *Engagement and transparency* are key strategies.

Relationships where it can be more challenging to build and maintain alignment are those where the distance is greatest. Often this is between the organization and the end-investor, and between the board and internal management. End-investors matter because they ultimately provide the funding, making alignment important for security of funding and hence discretion over trading. The relationship between the board and management matters because the board sets the terms by which management will be evaluated, such as objectives and benchmarks. If the board does not fully understand decisions, it may resort to managing strictly according to visible and measurable yardsticks, such as performance versus benchmark. Further, a strong board may start imposing its own will, rather than delegating to managers. Such governance practices can grate against the pursuit of long-term investing, partly because managers then begin to focus on managing the numbers or their relationship with the board, when they should be focusing on optimizing long-term investment outcomes.

The Future Fund has provided an account of how the relationship between the Australian Government, the Board of Guardians and management is structured. This appears in the hold-out box over the page.
The Future Fund: Relationship between the Government, the Board of Guardians and Management

In the case of the Future Fund, the statutory governance arrangements are designed so as to provide clear delineation of roles and responsibilities for the Government, the Board of Guardians and management.

The Future Fund Act (2006), which establishes the statutory governance arrangements, provides the Government, through the responsible Ministers, with oversight of the Funds subject to the arrangements that establish the independence of the Board of Guardians. The Government’s role includes the appointment of members of the Board of Guardians and the establishment of Investment Mandates for each of the Funds for which the Board of Guardians is responsible. Legislation also sets out the purpose, funding and withdrawal arrangements for the Funds, and mechanisms for reporting and accountability.

At the same time, the responsibility for making investment decisions is clearly allocated to the Board of Guardians. Moreover, the independence of the Board of Guardians in making these decisions is emphasized in a number of ways, including:

- the expenses of the organisation are met from the assets of the Funds, rather than from an appropriation through Parliament;
- the Board of Guardians must be consulted on the Investment Mandate directions, which themselves must be consistent with the requirements of the legislation; and
- Board members must be drawn from outside government, and meet the requirements of having substantial expertise and professional credibility in investing or managing financial assets or in corporate governance.

In parallel with the statutory arrangements establishing clear lines of responsibility and accountability, the Future Fund itself has placed significant emphasis on building tight alignment between the Board and the management team. This was a matter that was openly and deliberately addressed at an early stage. Significant effort was applied to putting in place processes and protocols to drive this alignment, and to identify and reduce any emerging gaps between the objectives and understanding of the Board and the management team. This included the development and periodic review of shared investment beliefs; and the deliberate creation of regular opportunities to review the entire portfolio, its positioning, and its consistency with the investment beliefs and the investment objectives.

(b) Guiding Principles

A base for alignment can be established through embedding long-term investing within the stated principles that guide the organization: its mission, purpose and beliefs. A number of commentators make suggestions to this effect, including Gray (2006), Atherton (2007c), Marathon (2007), WEF (2011, 2012) and Ambachtsheer (2014). Continuing with the antipodean examples, the Future Fund and the NZ Super Fund both explicitly refer to delivering returns over the long term within their mission statements (underlining added):

“We are a funds management business focused on delivering high, risk-adjusted returns over the long term on contributions to special purpose public funds. Operating independently from the government, we will tailor the management of each Fund to its unique mandate while delivering efficiency through common infrastructure.” The Future Fund, ‘Annual Report 2012/13’, p3

“Maximize the Fund’s return over the long term, without undue risk, so as to reduce future New Zealanders’ tax burden.” New Zealand Super Fund, ‘How We Invest’, p8

As a point of contrast, some investment organizations view their purpose as relating to aspects such as delivering performance, or meeting investor needs. For instance, consider two of Australia’s largest providers of investment products. AMP Capital refers to their “commitment to delivering outstanding investment outcomes for our clients” as being at the heart of everything they do. Colonial First State presents itself as offering “An active management approach seeking to outperform … Put simply, we aim to outperform the benchmark”. As a global example, Fidelity Worldwide states: “Our fundamental mission is to help customers and clients achieve their financial objectives”. Whereas there is nothing at all wrong with any of these principles, they are not as likely to be as effective as an expressed and pointed reference to the long term if the intention is to pursue long-term investing.
(c) **Culture**

Culture can provide the glue within an organization that might assist in building alignment and hence orienting it towards the long term. Much of the literature alludes to culture implicitly, if not explicitly, e.g. Laverty (2004). Culture is a somewhat nebulous concept. Indeed, the body of recommendations and suggestions appearing in this paper should all contribute to building a culture of long-term investment in some way. Nevertheless, there are two specific areas which we consider to be particularly relevant:

- **Leadership** – A number of commentators make the point that leadership matters for driving change and establishing a long-term culture, see: CFA (2006); Atherton et al. (2007c); Marathon (2007). Those in charge often have a strong influence over the tone in an organization. This influence arises through the examples they set; through what they choose to focus on and reward; and importantly through what actions and behaviours they are not willing to tolerate. It is worthwhile to continually reinforce a long-term culture through ongoing reminders of the guiding principles, objectives, and so on.

- **Capacity to adopt non-consensus positions** – A capacity to be non-consensus is important for maximizing the benefits from long-term investing, as many of the better long-term opportunities emerge from market extremes arising from the behaviour of the crowd (see Paper 2). The importance of being able to adopt non-consensus positions is recognized in the literature. For instance, Vaughan (1992) refers to willingness to ‘go against the crowd’; while Ang and Kjaer (2011) as well as Jones (2012) call for the capacity for contrarian and counter-cyclical behaviour to be institutionalized. WEF (2012) refers to the importance of protecting appropriate risk-taking and experimentation. Actions that might help encourage a non-consensus culture include: focusing discussions around ‘where the market could be wrong’; soliciting of non-mainstream opinions; and being very careful to ensure that radical views are not dismissed too quickly.

(d) **Trust**

We will deal with trust separately and specifically, although there is considerable overlap with alignment in terms of its relevance and how it may be built. Section 2 discussed how long-term investing requires commitment not only of funds, but also to the investment manager. Trust might be seen as a form of commitment (and accordingly entails similar costs and trade-offs to those discussed in Section 2). Trust requires placing faith in managers to do what is best over the long term, rather than managing them by the flow of numbers. Laverty (2004) states: “Firms that establish climates of trust regarding such tradeoffs – that is, they protect individuals from having to constantly answer to short-term performance pressures that may be contrary to achieving long term success – are less likely to undervalue the long term”. WEF (2012) also acknowledges the importance of trust. Along these lines, the suggestion made by both Kay (2012) and Ambachtsheer et al. (2013) to base engagement around relationships, rather than transactions, is partly made with a view to building trust and respect. Consistent with the previous discussion of alignment, these authors see a role for greater transparency in engendering trust. Trust is enhanced through engagement. It can be destroyed by calling investment managers to account too quickly.

(e) **Governance and Decision Structures**

Governance is critical in any investment organization. Here we limit the discussion to selected principles or techniques related to governance and decision-making structures that are specifically relevant for long-term investing. Aspects related to board composition are discussed under part (f), which deals with ‘people’.

- **Clear objectives, with a long-term focus** – Clear objectives are an important component in managing agency issues and ensuring alignment. Stated objectives should be evidently long-term in focus, and ideally singularly so in order to avoid temporal trade-offs (see next dot point). For instance, Marathon (2007) recommends setting clear objectives with a horizon over a full cycle, e.g. 5-7 years. Dual objectives that refer to short-term outcomes should be avoided, e.g. a parallel objective to ‘outperform the peer group over 12-months’. Indeed, relative performance objectives should be avoided where possible, as they encourage herding and draw attention towards what other players are doing and hence away from maximizing long-term outcomes. Further comments on these matters appear under the discussion of performance evaluation in part (c) of Section 4(iv). An account of the Future Fund’s objectives, and how
they are being interpreted, appears in the hold-out box at the bottom of the page. This is followed over the page by comments on the Future Fund’s governance and decision structures.

- **Identify and manage temporal trade-offs** – Laverty (2004) as well as Marginson and McAulay (2008) observe the role of ambiguity in encouraging short-term behaviour in organizations. Temporal ambiguity may occur where employees are asked to make poorly-defined inter-temporal choices between the short term and long term. This is to be avoided in the first instance. Where temporal trade-offs do exist, Irving (2009) recommends that they be identified, clear responsibility be assigned for their management, and that those responsible are not placed under undue stress. In the context of long-term investing, this means that fund managers should ideally be required to consider, and be expected to deliver, only long-term performance, and not be evaluated on short-term outcomes. Where this cannot be avoided, clear responsibility and guidance should be set for weighing short horizon versus long horizon objectives, lest short-term outcomes are afforded undue attention because they seem more pressing or tangible.

- **Framing and presentation** – A number of authors raise the importance of framing and presentation: an issue that is also relevant for incentives and the investment approach. The idea is to make the long term more salient. One approach is to focus attention on whether outcomes are on track to achieve long-term goals, rather than period-by-period returns (Denison, 2010). Performance would thus be reported in the context of some long-term target or broader objectives (Marathon, 2007; Jones, 2012; Kay, 2012; WEF 2012), such as capital protection or adequate income in retirement (Stewart, 2014).

- **Build resistance to myopic loss aversion** – The literature has identified a number of strategies to reduce the impact of myopic loss aversion that might be built into governance and decision processes. Many of these overlap and reinforce suggestions that we make at other points in this paper:
  - focus on long-term outcomes when reporting (Benartzi and Thaler, 1999);
  - establish less frequent feedback and less opportunities to take action (Fellner and Sutter, 2009);
  - encourage team decision-making (Sutter, 2007); and
  - require decisions to be explained (Vieider, 2011; Pahlke et al., 2012).

---

**The Future Fund – Objectives and their Interpretation**

The Future Fund Investment Mandate asks the Board of Guardians to generate a return of 4.5-5.5% above the Australian Consumer Price Index (CPI) over the long term, while taking ‘acceptable but not excessive risk’.

Early in the life of the Future Fund, the Board spent a considerable amount of time interpreting the Mandate, and qualifying the distinction between ‘acceptable’ and ‘excessive’ risk. The Board ultimately concluded that they should try to: i) maximize the value of the Future Fund over the long term, defined as rolling 10 year periods; and, ii) minimise the risk of significant capital losses along the path, with a particular focus on expected downside outcomes over rolling 3 and 10 year periods.

There is sometimes friction between these two objectives. So to guide its approach, the Board developed a set of investment beliefs that is consistent with its interpretation of the Mandate and its understanding of what constitutes acceptable risk. Given its particular belief that prospective risk and returns vary materially over time, the Board is cognisant that there could be periods when pursuing a real return of 4.5-5.5% ex-ante may not be achievable without embedding an ‘excessive’ level of risk in the Future Fund.
The Future Fund's Governance and Decision Structures

The Board of Guardians believes that portfolio management should be focused on the specific objectives and risk definitions of the Future Fund; and that investment portfolios are most efficiently managed as a whole, rather than as a collection of individual underlying sub-portfolios. The Board also believes that the risk profile of the Future Fund should be managed dynamically as conditions evolve; and that its unusually long horizon provides a competitive advantage to add value by pursuing a more countercyclical investment strategy than many other market participants.

This governing philosophy drives the manner in which investment opportunities are evaluated by the management team and the Board. A Manager Review Committee and an Asset Review Committee, each comprising of a representative cross-section of the investment team, assess investments on their individual merits. The Investment Committee, itself a diverse body drawn from the ranks of senior management, then determines whether these opportunities are complementary to overall portfolio construction before they proceed to the Board for final approval.

This approach motivates a holistic discussion on each investment opportunity considered by the Future Fund, with a principal focus on the expected risk-adjusted contribution to long-term portfolio return and achievement of the Investment Mandate.

(f) People

Human resources is another component in orienting an organization towards long-term investing, again because it can help limit the risk of misalignment and hence agency problems. There are three facets. The first is employing the right people. Vaughan (1992) and Gray (2006) recommend employing only people with affinity to long-term investing. WEF (2011, 2012) states similar sentiments; and extends the point by emphasizing the importance of a professional board that is capable of shrugging off short-term pressures. Barton and Wiseman (2014) also emphasize the importance of the board, stating that it should be: independent; professional; possess relevant expertise; have the time available to be engaged; and be committed to a long-term investment philosophy. Gray68 (2014) highlights the relevance of personality type for successful institutional investing.

The second facet is tenure. Denison (2010) and WEF (2012) both suggest avoiding short tenures for trustees or management. Turnover of employees (including key board members) can create discontinuities in the commitment to seeing strategies through to their conclusion. New employees often want to put their own stamp on the direction that an organization takes. The risk of making inappropriate changes is exacerbated where an investment has initially performed below expectations. In this instance, new staff can be even more tempted to make changes because they lack ‘ownership’ of the position. Ellis (2011) warns against excessive turnover of board members, staff and investments managers. He suggests that ‘best practice’ is an average tenure for board members of 6-7 years, and around 10 years for managers. Arguably, longer-than-average tenures may be appropriate under long-term investing.

The third facet is demonstrating commitment to employees. This facet takes a broader perspective on the notion of commitment to fund managers, as was discussed earlier. Those working for the organization can only be relied on to pursue a long-term approach if they expect to be around for the long haul: the staff themselves should expect an extended career at the organization (Ellis, 2011). To help build such an expectation, the organization should set out to show that it is committed to its employees, and trust that they will reciprocate. Terminations should not be handed out lightly; and the messaging around commitment to staff in issuing termination notices should be considered. The discussion around the costs and trade-offs associated with commitment in Section 4 also applies to employees.

(g) Collaboration with External Managers

Finally, similar issues of alignment apply when external managers are involved. Again, the aim should be to manage the agency arrangement to ensure alignment and direct focus towards the long term. This will entail

68 Jack Gray, in providing feedback on an earlier draft, pointed towards the benefit of learning from successful individuals or organizations who can act as role models for how to pursue a long-term approach. These might come from outside the investment industry. Furthermore, the learning is best done over a period of many years.
applying many of the ideas raised earlier when dealing with external managers. This includes affording them commitment, trust and engagement; as well as employing the right manager in the initial instance. 69

The literature contains a number of useful ideas on how collaboration with external managers might be structured. Both Kay (2012) and Ambachtsheer et al. (2013) suggest the relationship between managers and investors should be made more characteristic of a partnership, built on mutual trust and respect. Establishing contracts with extended terms is a popular suggestion in the literature (see Hewitt, 2004; Atherton et al., 2007b, 2007c; Mercer, 2010; Croce, 2011; Ambachtsheer and Bauer, 2013). Some commentators raise the idea that contracts should be based on the presumption of continuity with termination clauses 'like an employment contract' (Hewitt; 2004; also Croce, 2011; Reid, 2013). Supposedly this would send a signal of the intention to maintain a long-lived relationship. Even though this may not prove to be the case, the main idea is to create an expectation ex ante that the manager will be employed for the long term. The hold-out box below describes how the Future Fund manages its relationships with external managers.

An alternative to relying on external managers is to invest directly. WEF (2011) suggests that internal management of assets may lead to better alignment with long-term investing, relative to what can be achieved using external managers. There are a range of positives and negatives around in-house management, which we leave for another time.

The Future Fund and External Managers

Since inception, the Future Fund's investment team has endeavoured to remain as small and nimble as possible, and as large as is necessary to cover its investment universe. Of the Future Fund's employees, almost half are investment professionals. Sector heads are tasked with forming their own investment views; as well as engaging regularly with managers to identify or critically evaluate opportunities, monitor performance, and assess asset divestment potential.

The model for accessing investments varies depending on the asset class and the nature of the opportunity.

In listed equities, debt and alternatives, the Future Fund will typically adopt an outsourced model, with the selection and execution of individual investments being fully outsourced to third party managers. Having said that, the internal team still actively monitors and manages the sub-sector strategic exposures – this is far from a typical 'manager of managers' approach.

In private markets, in addition to delegating management to external managers, the Future Fund may pursue co-investment opportunities, such as with private equity managers. Alternatively, if alignment issues are significant, it may choose to invest directly, and subsequently outsource management of the asset when the commercial position is such that alignment may be achieved (for example, in infrastructure).

The Future Fund prefers fewer and more meaningful external relationships. It selects managers for their ability to generate information and insight; their willingness to genuinely collaborate and share knowledge; and the breadth of their collective coverage. Indeed, an essential part of the Future Fund’s investment process is the feedback loop created to capture the views of external managers on markets, investing themes or specific opportunities.

The Future Fund has built a small number of deep relationships with external managers. This helps the Future Fund and its external managers understand each other better, while improving the exchange of ideas and information. It also gives the Future Fund the practical ability to move quickly on new opportunities.

The Future Fund’s focus on alignment and building relationships has enhanced the quality of investment opportunities available to it; and helped to make its integrated investment process more efficient.

---

69 One additional hurdle is that it may be difficult for some external managers to ring-fence a long-term portfolio from other shorter-term investment operations. Such issues reinforce the need to select appropriate managers.
(ii) Setting the Right Incentives

The central role of incentives in influencing investment horizon is widely recognized, as discussed in Paper 1. Most commentators on the short-term versus long-term investing debate recommend extending the time frame for performance evaluation and remuneration, if longer investment horizons are to be encouraged. We view incentives as an important facet of orienting the organization, and managing principal-agent relations. Nevertheless, incentives cannot guarantee alignment by themselves. However, they can destroy it if poorly structured. The main role of incentives is to avoid disrupting a long-term focus, and if possible, assist to cement it. Building alignment with long-term investing in the initial instance is the primary driver.

Extending the incentive time frame is not as easy as evaluating performance and paying bonuses only after an extended period (say, 5 or 10 years); and ignoring what happens along the way. Fund managers should ideally have their contribution in progressing towards long-term objectives evaluated on an ongoing basis, and accordingly be held accountable for their ‘performance’ in this sense. Ongoing evaluation can help to control the agency risk that accompanies the commitment to the manager that affords them the latitude and confidence to pursue long-term investing. Commitment need not be open-ended; but should be conditional on evidence that a manager is being diligent in pursuing a long-term approach.

In addition, it is often practically infeasible to award performance bonuses only after extended periods. The industry standard of yearly bonuses is hard to ignore in a competitive market for talent. Staff mobility also needs to be accommodated, given that fund managers may move on for a range of reasons, such as organizational change, promotion or personal reasons. It cannot be reasonably assumed that fund managers will be retained for long periods, notwithstanding an initial intention that this be the case. The problem is not so much ongoing evaluation per se, but rather evaluation and rewards based around short-term outcomes, such as yearly returns. The challenge is to design performance evaluation and remuneration systems that incentivise fund managers to adopt a long-term focus, and ideally remunerates for long-term outcomes; while still retaining the scope for ongoing review and reward. The scope to game the incentive system should also be minimized. Some recommendations and suggestions are provided below. The hold-out box on the next page presents the Future Fund’s account of how it has designed its performance evaluation and incentive systems in support of a long-term approach.

(a) Direct and Co-investment (‘Skin in the Game’)

There is nothing that motivates like skin in the game. For a large institution, direct, in-house management might help avoid some of the agency and alignment issues associated with external management (WEF, 2011). Otherwise, co-investment is perhaps one of the best ways to ensure alignment between managers and investors. Accordingly co-investment should be accommodated or even insisted on where-ever possible, ideally in quantities that are financially meaningful to the manager. Commentators who appeal for greater use of co-investment include Rappaport (2005), CFA (2006), Atherton et al. (2007b) and Marathon (2007). Nevertheless, co-investment does not necessarily encourage long-term investing in its own right. The environment under which it occurs needs to create an incentive to adopt a longer horizon. This will occur where the manager has a meaningful personal investment in a fund that will exist for the long term, and holds the expectation of a long management tenure.

Co-investment might come in a variety of forms. The act of purchasing a specific asset or investment alongside an existing manager or small group of like-minded investors may secure alignment and greatly reduce agency costs, if not eliminate them. For instance, WEF (2012) suggests that alignment of interests might be enhanced through ‘carried interest’ and parallel investment, as used in the private equity industry (albeit subject to other considerations such as how manager fees are structured). Co-investment may be secured through granting units to the manager, perhaps with funding provided. Another idea is to direct a portion of remuneration towards investment in the fund. For instance, the idea put forward by WEF (2011) of investing bonus payments into a ‘parallel portfolio’ is actually a form of co-investment. Finally, the potency of co-investment in encouraging a long-term approach would be enhanced if restrictions are imposed on the sale of units for an extended period.
Performance Evaluation and Incentives at the Future Fund

The experience of the Future Fund suggests that putting in place incentives to encourage long-term investing can only be part of the story – whether it be for external fund managers, or for staff within an institution. Establishing arrangements designed to drive a long-term perspective will not be successful if the nature of the organization or individual is inclined towards a shorter-term view. Long-term incentive arrangements are unlikely to change someone from being a short-term investor into being a long-term investor. It will, however, encourage an investor with some preference for, or interest in, the long term to exercise and prioritise that capacity.

This view leads the Future Fund to recognize the importance of identifying and selecting the right managers and people in the first place. This reinforces earlier comments about employing the right people; identifying and engaging investment managers with an orientation towards the long term; working on the aspects of culture, governance, trust, commitment and collaboration; and putting in place specific incentive structures that may draw on the suggestions provided.

The Future Fund structures its performance related payments to reflect both portfolio performance over three year periods, and assessment against role-specific goals and objectives. It applies this to all staff members as part of its focus on securing alignment across the organization.

The total portfolio performance component combines both an absolute return element, which measures the success of the investment strategy in achieving the Mandate’s baseline target of CPI+4.5-5.5%; and a relative return element, which measures the skill of implementing the investment strategy against the policy portfolio implied by the Target Asset Allocation set by the Board of Guardians. The absolute return component is weighted more heavily in this framework, to ensure that the management team is incentivised to maximize real returns, rather than simply outperform the policy portfolio.

Incorporating assessment against role-specific goals and objectives means that, in addition to providing a direct link to the Future Fund’s performance, variable remuneration can reward important contributions to qualitative factors that contribute to investment performance. In the Future Fund’s case this includes, for example, the extent to which employees collaborate across the portfolio, constructively challenge accepted ideas and orthodoxies; or identify and establish productive relationships with other institutions. The inclusion of these qualitative factors also reflects a more fundamental element of the Future Fund’s approach to recruitment. The organization seeks to hire people whose personal ‘compass’ is aligned toward achieving the Fund’s long-term objective, rather than simply generating short-term returns. Put another way, the remuneration structure is designed to combine a focus on the portfolio’s financial performance, with consideration of the quality and sustainability of how that performance is achieved.

While use of a three year period for total portfolio performance and an annual assessment against role-specific objectives does not align perfectly to the Fund’s long-term horizon, it nonetheless provides some extension to the incentive horizon, while recognizing the realities of employment arrangements and the capacity for people to move to other organizations.

(b) Subjective Component

Including a subjective component in performance evaluation, and hence remuneration, can be particularly helpful for reinforcing incentives to pursue long-term investing. In essence, it can be used to encourage and reward behaviour that is deemed consistent with pursuit of a long-term approach. Subjective components provide a mechanism to deal with the difficulty of measuring the success of a long-term investment with confidence until sufficient time has passed. Consistent with these notions, Marathon (2007) and Ambachtsheer et al. (2013) recommend placing greater emphasis on qualitative reporting in order to deflect attention away from quantitative factors, as well as to engender greater transparency and trust in decision-making. WEF (2012) warns against relying solely on measures of return and risk with long-term investments, especially when unlisted assets are involved. As mentioned in the above hold-out box, a material component of performance-related remuneration at the Future Fund is informed by an assessment of how the employee has performed with reference to their individual responsibilities and behaviour.
(c) Measuring Performance

A range of ideas for how performance should be measured have been put forward in the literature. These are summarized in point (vi) of Appendix A. Many commentators call for the interval over which performance is evaluated to be extended, perhaps to as long as 10 years. While extending the performance measurement interval can play a role, it may not be appropriate in all circumstances. We aim to present more flexible solutions. We offer three suggestions.

- **De-emphasize relative performance** – We endorse the recommendation to de-emphasize relative performance measures, such as returns versus benchmark indices or peers, e.g. see Vaughan (1992); Denison (2010). Focusing on relative performance encourages short-term behaviour and herding, if it becomes the primary benchmark by which success is judged on an ongoing basis, and thus feeds into aspects such as remuneration, career prospects and fund inflows. Unfortunately, relative performance can sometimes be difficult to ignore altogether. People may be drawn to benchmark themselves against others due to competitive instincts, status concerns, or curiosity about the effectiveness of other approaches. Relative performance measures might also be appropriate under some individual asset class mandates, to the extent that the manager is employed to deliver asset class beta plus hopefully some alpha. In these instances, the aim is to ensure that short-term relative performance concerns do not sidetrack managers from focusing on the long term. This might be done by evaluating relative performance over longer periods; affording relative performance measures a low weighting; and supplementing evaluations with ongoing engagement with the manager. Nevertheless, it is far preferable to adopt a singular focus on long-term objectives where feasible. The appropriate long-term performance benchmark will depend on the situation, but in many cases will be based around absolute real returns.

- **Measure performance in terms of progress towards ultimate goals** – The previous discussion of framing and presentation (see part (e) of Section 4(ii)) suggested that the organization at large should focus on whether outcomes are on track towards achieving long-term objectives, rather than period-by-period returns. The focus on progression towards long-term targets should be reinforced in the process of performance evaluation. Some points on the manner in which the Future Fund evaluates performance in light of its 10-year real return target can be found in the hold-out box over.

---

70 It might be a worthwhile exercise to discuss with managers how they believe their performance is best assessed, under the presumption of a long-term horizon.

71 Evaluating the skill and contribution of an investment manager can be problematic under absolute return benchmarks, to the extent that outcomes may be dominated by factors over which the manager could have limited control – such as the overall performance of markets, and the scope of available opportunities.
The Future Fund and Progression Towards Long-Term Objectives

The philosophy of the Future Fund is primarily focused on the ex-ante pursuit of an absolute return stream that is accretive to the achievement of its Investment Mandate. The Board and management also monitor how the Future Fund is progressing toward its long-term real return objective. Given the wide range of potential outcomes, the likelihood of fulfilling this objective over the period from inception to 2020 is also considered. The chart below provides a summary of this analysis as at 30 September 2014.

It is noted that the Board of Guardians of the Future Fund believes that peer group risk should not be used to shape strategy; and that the Future Fund Investment Mandate provides an unusually long-term investment horizon, which presents a competitive opportunity to add value.

Fan chart of the actual and forecast accumulated Future Fund return compared to the benchmark return (CPI + 4.5%pa)

- **Recast performance attribution** – The basics for this idea are presented in Appendix B, which sets out an approach to evaluating performance where realized returns are broken down into three components: (1) the long-term expected return (discount rate) on which the investment was initially based; (2) changes in discount rates; and (3) changes in expected cash flows. The approach presented in Appendix B is designed to focus performance evaluation around the components that reflect the fundamental drivers of long-term investing that are emphasized in Paper 1 – long-term cash flows and expected returns – while abstracting from the impact of changes in discount rates on short-term price fluctuations. The latter is de-emphasized on the basis that changes in discount rates largely impact the path by which returns are realized, rather than the effective return that is ultimately achieved over the long run. The idea develops a suggestion made by WEF (2011). The Future Fund uses an extended version of the basic approach, which is described in the hold-out box over the page. The Future Fund approach also breaks down changes in (real) discount rates into real rates and risk premia; allows for currency effects; and contains a residual capturing other elements, such as alpha and return effects related to other idiosyncratic risks.
The Future Fund – Return Attribution

The Future Fund views the linkages between the macro-economy and markets through a lens that emphasizes the top-down evaluation of discounted cash-flows. This process takes into consideration how economic variables and broad market risk premia might evolve relative to expectations in the future and, based on an assessment of what is priced into markets at any given time, examines the potential impact on discount rates and cash-flow growth for investments held (or under consideration).

While this approach is forward-looking by design, The Future Fund has also developed an ex-post quantitative return attribution framework to examine the core drivers of real returns. This framework utilises return data to distinguish between:

1. Impact of ‘time zero’ real discount rates, i.e. expected real return at the start of the period;
2. Changes in the underlying constituents of real discount rates: real interest rates, and systematic risk premia;
3. Changes in earnings (i.e. cash-flows);
4. Influence of currency; and
5. Residual that captures alpha, and other idiosyncratic risk premia.

The Future Fund finds this information very useful for gauging the efficacy of its investment strategy and its implementation. The chart below provides a summary of this analysis as at 30 April 2014.

### Attribution of total Future Fund annualised real return from 1 July 2009 to 30 April 2014

- **Real discount rate**: +5%
- **Real rate effect**: +1%
- **Risk premia effect**: +4.5%
- **Earnings growth effect**: -3%
- **FX return**: -1.5%
- **Alpha/other risk premia**: +2%

(d) Calculation of Performance Remuneration (Bonuses)

Consistent with calls for lengthening of the time frame over which performance is evaluated, many commentators also suggest only paying performance bonuses on results that are sustained over the long term. Some recommend the use of ratcheting effects with ceilings or caps, risk-controls and high water marks, e.g. Marathon (2007). While endorsing the general thrust of these recommendations, we see hurdles in implementing them. Deferring the award of bonuses until long-term performance can be measured may not be appropriate in all circumstances, for reasons discussed earlier. Further, basing bonuses on long-term performance with ratchets can have other unintended implications when a manager is lagging. For instance, it can encourage taking on more risk in order to catch up. Alternatively, lagging well behind in the performance required for a bonus can undermine incentives for effort, while creating an inducement to leave and set up shop elsewhere in order to reset the counter.
Nevertheless, the concept of paying bonuses conditional on performance being sustained for the long term is a worthy objective. The type of solutions we find of interest involve accruing bonuses on shorter-term performance, but only allowing them to vest conditionally over the long term – possibly even carrying into post-employment. This idea has been raised by a number of commentators, including: Hewitt (2004); Rappaport (2005); CFA (2006); Atherton (2007b); Waitzer (2009); G30 (2013); and Barton and Wiseman (2014). Indeed, G30 suggests vesting over 10 years, or even at retirement. Some advocate that bonuses be placed ‘at risk’ through claw-back provisions and the like, e.g. Hewitt (2004); Rappaport (2005); Waitzer (2009); WEF (2011, 2012). The WEF (2011) idea of investing bonuses in a ‘parallel portfolio’ that shadows the major fund is another way of placing awards at risk. These types of approach have the advantage that they reward only long-term performance, while still accommodating the industry norm of regular bonus awards. Deferred vesting also encourages the manager to remain with the organization, which helps cement commitment and provides additional incentive to adopt a long-term view.

We put forward a suggestion for the treatment of bonuses in the break-out box below. It is based around paying bonuses in the form of ‘performance bonds’, which pay out only if the gains underpinning the bonus are sustained over an extended period. This suggestion is a variation on an idea of the Squam Lake Group (2013) for structuring remuneration at systemically important financial institutions (SIFIs), whereby a portion of bonus remuneration is paid in the form a bond that vests after a period of time but is forfeited if the capital of the SIFI falls below a certain level. Our suggestion represents a translation of this idea into an investment management context. (Note: The performance bond idea is similar to placing bonuses in escrow, with claw-back provisions.)

Idea: Performance Bonds

This idea of the Squam Lake Group (2013) of linking bonuses to capital for systemically important financial institutions (SIFIs) could be translated into a fund management context by converting yearly performance bonuses into a ‘performance bond’. These bonds would vest over time (say 5 years), and would be forfeited if the fund unit price at the time of vesting falls below a reference point that relates back to the unit price at the time the bonus was awarded. The reference unit price might be escalated at some hurdle rate of return, such as the risk free rate, the risk-free rate plus a premium, or the return on a benchmark (i.e. relative return versus benchmark), as appropriate. Performance bonds would be held in trust and invested in a risk-free security.

The effect would be to pay a stream of bonuses which depend on (5-year) rolling performance, but are forfeited if the gains on which bonuses were accrued are subsequently handed back. This effectively creates a barrier put option written by the fund manager, equivalent to the value of the bonus.

The bonds should extend beyond any employment contract. This would create an incentive for the fund manager to only pursue gains that are considered sustainable; to retain their position with their fund in order to make sure that any bonuses are secured; and, if they do have to leave the organization, to ensure that the fund is passed into good hands.

A related alternative is to invest bonuses in a ‘parallel portfolio’, as suggested in WEF (2011). In this case the fund manager remains fully exposed to the performance of the portfolio until bonuses vest. The issue with this idea is that some bonus would still be paid even if performance is not sustained, albeit at a diminished level. For instance, say a fund manager takes a position that earns a 25% return that is subsequently wiped out by a 20% decline. The fund manager would still retain 80% of their bonus under a parallel portfolio; whereas the entire bonus would be forfeited under performance bonds. The parallel portfolio idea thus may not be as effective in circumventing the incentives to pursue short-term returns. WEF’s idea is like co-investment, whereas performance bonds, as well as the Squam Lake Group idea, are structured as options.

There are some problems with performance bonds. The fact that the fund manager remains exposed to a portfolio that they do not control after they have left cuts against the concept that people should be evaluated and remunerated for outcomes over which they have control. The option-like nature of the pay-offs will also create an incentive to de-risk (i.e. reduce volatility) after a big win in order to secure the bonus. This may not necessarily be a bad thing given the way markets can operate; but may not accord with the preferences of the end-investor. Nevertheless, these problems seem relatively minor relative to the benefit in terms of incentivizing fund managers to care about generating gains that are sustainable over the long term.
(iii) Establishing a Long-Term Investment Approach

It is difficult to be prescriptive about what entails a long-term investment approach. There are many contrasting types of investment philosophies and processes that might be considered ‘long term’. For example, both value and growth investment styles can be applied in a fashion that amounts to a long-term approach. Nonetheless, the crucial element is adopting an approach that looks beyond the short term towards the drivers of long-term outcomes.

Paper 1 discusses how a long-term investment approach will tend to have an investment philosophy, process and procedures that are directed primarily towards long-term value and/or expected return, rather than near-term price changes. Further, the information employed should be aimed towards identifying the drivers of long-term value. Taking into consideration the potential future evolution of expected returns for the purposes of implementing a dynamic strategy may also be consistent with a long-term approach. In this case, the distinguishing element would be the attempt to identify the optimal path towards meeting long-term objectives, as opposed to trying to pick the next market move (see discussion in Paper 1 and Paper 2). In any event, the key element is that a long-term perspective is ingrained within any analysis that is undertaken; items that are discussed by the investment team; and ultimately the investment signals that are used to identify trades. In other words, long-term approaches are distinguished by the perspective and horizon adopted.

Another distinguishing feature is how risk is viewed. The main risk for long-term investors is failure to achieve long-term objectives, i.e. shortfall versus objectives. This can take on a particular character under long-term investing. Events that lead to a permanent loss of value are likely to be of prime concern. This will often occur where an investment is made based on faulty estimates of long-term cash flows or expected returns: an aspect that was discussed in Paper 2 as a key pitfall for long-term investors to avoid. Poor estimates can arise for reasons ranging from analytical error, to failure to anticipate long-term forces. On the other hand, short-term fluctuations that are subsequently reversed – perhaps associated with changes in discount rates that ‘reorder’ the sequence by which long-term returns are accrued – are not primary risks for long-term investors. Such short-term volatility is typically the prime concern of short-term investors.

A basic example may provide some intuition about what constitutes a long-term investment approach. Consider a long-term equity market investor who takes positions solely based on the difference between share price and discounted cash flow (DCF) valuations based on projected free cash flows through to perpetuity. This would amount to a long-term approach to the extent that all analysis and internal discussion is directed towards the estimates of long-term cash flows. Further, any news would be discussed only in terms of the implications for future cash flows. Little heed would be paid to the immediate economic outlook, how results compare with consensus, what other investors are doing, and so on – except to the extent that they contain information relevant to the long-term forecasts. All other information would be considered short-term noise that should be filtered out. Risk in this context would relate to mis-estimating long-term cash flows. This is because any unanticipated decline in long-term cash flows could be associated with a sustained share price decline, and may amount to a permanent loss of value that may never be recovered.72

Figure 4 provides more substance by contrasting some of the likely points of focus under long-term versus short-term investing approaches. Not all items listed would always feature. Nevertheless, they may give some sense of the type of characteristics that a long-term investment approach might concentrate on, as well as those it should probably ignore.

---

72 The basic approach to performance evaluation set out in Appendix B suggests an investment process that closely aligns with the discussion in this paragraph.
Figure 4: Long-Term vs. Short Term Investment Approaches – Points of Focus

<table>
<thead>
<tr>
<th>Long-term investors will tend to focus on:</th>
<th>Short-term investors will tend to focus on:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Long-term cash flows and returns</td>
<td>• Immediate price changes</td>
</tr>
<tr>
<td>• Risk premiums that accrue over long periods</td>
<td>• Actions of other investors</td>
</tr>
<tr>
<td>• Valuation, especially absolute value and NPV</td>
<td>• Momentum</td>
</tr>
<tr>
<td>• Mean reversion potential</td>
<td>• Catalysts for price adjustment</td>
</tr>
<tr>
<td>• Evidence of unsustainable market extremes</td>
<td>• News flow, and likely market reaction</td>
</tr>
<tr>
<td>• Long-term themes</td>
<td>• Current themes: what is the market trading on?</td>
</tr>
<tr>
<td>• Optimal path to future value (dynamic strategies)</td>
<td>• The next trade</td>
</tr>
<tr>
<td>• Whether to ‘sit out’ of the markets, i.e. cash up</td>
<td>• Delivering the best possible performance over the short-term (often in relative terms)</td>
</tr>
<tr>
<td>• Future opportunities: attractive investments; value-accretive use of cash flow; real options</td>
<td>• Current economic and market trends, e.g. state of the economic cycle; central bank actions</td>
</tr>
<tr>
<td>• Long-term cash flow generation potential, including: profitability / return on capital; competitive advantage; market structure; capital intensity; scalability; network effects; earnings announcements interpreted in terms of implications for long-term earning potential</td>
<td>• Flow of immediate results – how earnings might compare with market expectations; and the likely market reaction</td>
</tr>
<tr>
<td>• Stewardship</td>
<td>• Stop losses, e.g. cutting losing positions; exercise the ‘Wall Street walk’ for wayward companies</td>
</tr>
<tr>
<td>- management capability and integrity</td>
<td></td>
</tr>
<tr>
<td>- governance and alignment</td>
<td></td>
</tr>
<tr>
<td>- universal ownership</td>
<td></td>
</tr>
<tr>
<td>• Demand/supply mismatch as a source of mispricing and hence opportunity</td>
<td>• Demand/supply mismatch as a motivator for near-term price movements</td>
</tr>
<tr>
<td>• Risk viewed as:</td>
<td>• Risk viewed as:</td>
</tr>
<tr>
<td>- failure to achieve long-term objectives (shortfall)</td>
<td>- volatility over shorter horizons</td>
</tr>
<tr>
<td>- permanent loss of value</td>
<td>- gains not occurring quickly (limits to arbitrage)</td>
</tr>
<tr>
<td>- mis-estimating long-term value / returns</td>
<td>- illiquidity: being forced to sell at the wrong time</td>
</tr>
<tr>
<td></td>
<td>- underperformance vs. benchmark or peers (aligned with, but not inherently, short term)</td>
</tr>
</tbody>
</table>

As an example of the approach taken by a long-term investor, a detailed account of the investment process employed by the Future Fund appears in Appendix C. A few comments are offered below to provide context for readers intending to read this appendix.

The Board of Guardians believes that the Future Fund Investment Mandate provides an unusually long term investment horizon, and that this presents a competitive opportunity to add value. It also believes that the single measure that embodies the goal of the Future Fund relates to achieving the mandated returns over rolling 10 year periods. In this context, the primary risk faced by the Future Fund is failing to meet this objective. As a consequence, the Board of Guardians believes that high quality governance of the investment process is critical to success. The likelihood of meeting investment goals is directly related to the time, expertise and organizational effectiveness applied to decisions by the Board and management.
(iv) Harbouring Discretion over Trading

The key to harbouring discretion over trading is to avoid placing investment managers in the position where they are forced to conduct trades they would not otherwise undertake. As discussed at length in Paper 1, the nature of funding and liabilities is integral. The need to liquidate due to withdrawal of funding is the most likely way in which discretion over trading may be lost; although directions or pressure to invest funds in a certain manner may also be relevant.

Steps that might be taken by an investment organization to avoid forcing managers to trade in response to funding shifts are the focal point of the discussion here. However, there is also a link between discretion over trading and some of the organizational settings that were discussed in Section 4(i). For instance, discretion over trading can be lost through withdrawal of support from the broader organization or its stakeholders. This may come in a number of forms, including covert pressure to take action to turn around performance, pointed directives, or even replacement of staff who fail to ‘behave as required’. Hence, potential impacts on discretion over trading need to be considered when designing the organization. The general aim is to insulate those making the investment decisions from any external pressures to trade, leaving them unfettered to focus on delivering long-term outcomes. The discussion on commitment to the manager is relevant here.

The nature of funding and liabilities will make some institutional investors more natural candidates for long-term investing than others. The ultimate situation would be for the funds to be committed for a very long period. Such situations are rare. Many endowment and foundations fit the bill in some respects. Nevertheless, expenditure and other commitments may limit the amount of discretion under some circumstances. The difficulties that the Harvard endowment fund encountered during 2008 (see Ang, 2011) is an example of how a supposedly long-term investor can run into a pressing need to deal with short-term cash flow problems. Sovereign wealth funds are another investor class that may be well suited to long-term investing, providing that the funds are committed. For example, the Future Fund is protected by legislation from withdrawals until 2020.73 Its New Zealand counterpart, the NZ Super Fund, is not expected to encounter withdrawals until 2029. Defined benefit pension funds can be potential candidates for long-term investing, as they tend to have security of funding plus relatively predictable cash flow needs to the extent that future liabilities are forecastable. The main issue faced by many defined benefit funds is pressure to respond to estimated funding deficits. Similar comments may be made with respect to life insurance and their solvency requirements.

At the other extreme, some institutional investors are inherently poorly suited to long-term investing due to the nature of their funding and liabilities. For instance, some investment vehicles are specifically designed and purchased to provide liquidity. Examples include open-ended mutual funds, which are bought by investors who value and need the liquidity they offer. Pursuit of long-term investing is more likely to fail in such situations.

Hence the need, scope and appropriate methods for harbouring discretion over trading will very much depend on the circumstances. Our main interest is institutional investors that sit in the middle ground, where investments are being made with a view towards long-term outcomes, yet funding may not be locked in. Defined contribution pension funds are most notable. Here the assets are typically being invested for a long-term purpose, yet providers can be required to provide portability to members in many jurisdictions. Below are four actions that should assist in harbouring discretion over trading by making funds ‘stickier’. Our suggestions are roughly arranged in descending order of potency, and broadly break down into two groups. The first two ideas – using closed-end fund structures and providing facilities for investors to opt-out of their right to redeem – might be considered ‘strong’ actions, as they guarantee security of funding up-front. The other two actions – establishing the capacity to defer redemptions (e.g. gates) and imposing switching costs – are weak, in the sense that they provide limited security of funding and can involve some problematic elements. Any solutions that lock investors into funds should be offered only to those who are sufficiently informed to appreciate the implications.

---

73 The Future Fund Act (2006) prohibits withdrawal from the Fund before 2020 unless its balance exceeds the target asset level as specified under the Act in the interim.
(a) **Use closed-end fund structures**

Closed-end funds are the most straightforward way to guarantee security of funding for the manager and hence harbour discretion over trading, albeit at the cost of enhanced agency risk (see Stein, 2005, Cherkes, 2012, and the discussion in Section 2). Furthermore, if a market is provided in a closed-end fund, then liquidity is made available to end-investors.

Closed-end fund structures may play a role in fostering long-term investment via two avenues. First is as a structure under which some institutional investors might offer their own products. Many institutional investors could at least consider if their funds are suitable to be offered in closed-end form. For instance, a traditional balanced fund could conceptually be unitized and packaged as a closed-end fund under certain situations, possibly coupled with exchange listing and even controlled mechanisms for creation or retirement of units as investment demand fluctuates. This approach might be suitable for products that contain large exposures to unlisted assets, and are marketed to investors who desire such exposure. Some equity fund managers offer both open-end and closed-end products in parallel; and the same might be done in other forums, such as for pension funds or certain unlisted assets. The closed-end version could be sold on the basis of having greater latitude to pursue a long-term approach, including enhanced scope for exposure to illiquid and/or unlisted assets.

The second avenue is to use closed-end funds as a vehicle when outsourcing to external managers. Closed-end funds are already widely used in the unlisted asset space, with private equity, REITs and some property syndicates being notable examples. Institutional investors could establish a preference for closed-end over open-end funds on the basis that it fosters a long-term approach by the manager through offering discretion over trading and demonstrating commitment. (An alternative approach is direct engagement with external managers, which we discussed under Section 4(i).)

(b) **Redemption opt-outs**

Evidence exists that investors may be openly willing to enter into commitment arrangements if they are made available, see Thaler and Benartzi (2004); Sourdin (2008). Hence an approach might be to offer a product that provides investors with the capacity to commit by permitting them to opt-out of their right to redeem on a voluntary basis. Redemption opt-out products might even exist alongside comparable liquid versions which provide redemption facilities for those who need it, thus presenting investors with a choice. One incentive to adopt the redemption opt-out product could be the promise of access to a broader range of investments and strategies, including greater exposure to illiquid assets. If this is considered too nebulous and not well understood by many investors, more mundane but tangible rewards might be considered, such as lower fees, perhaps tied to the absence of costs associated with providing redemption facilities. An idea that accords with that being discussed here was put forward by Industry Super Australia (see ISA, 2014) in a submission to Australia’s Financial System Inquiry (FSI) of 2014.

(c) **Capacity to defer redemption**

Another solution is to establish the capacity to defer redemption under certain conditions, with the explicit intention of protecting the fund from having to sell assets in response to unexpected loss of funding. This mechanism is well-established in the unlisted asset arena, where it comes in the form of extended redemption notices, set redemption periods, and the ability to impose a ‘gate’ under more extreme circumstances. We note that the Association of Superannuation Funds of Australia (see ASFA, 2014) recommended that consideration be given to lengthening the redemption terms for Australian superannuation funds in a submission to the FSI. The FSI also called for more information on easing the portability rules in its Interim Report.

Extending redemption represents only a partial solution to providing security of funding, and entails a number of problems. While capacity to defer redemptions may help manage around the worst effects of needing to liquidate assets, it does not remove the requirement for eventual liquidation, which can operate as a constant overhang. Gates can be particularly problematic. When utilized, they can impose unexpected costs or hardship on investors. Furthermore, they may have negative connotations for the investment organization involved. Hence gating is typically considered an undesirable event to be avoided. For these reasons, possessing a
capacity to defer redemption may not remove all the wariness over investing in illiquid assets or other long-term investments. While it may assist an institutional investor in pursuing long-term investment, it is weaker than approaches where funding is locked in.

(d) **Raise switching costs**

The academic literature presents evidence that switching costs may assist in increasing commitment and discouraging unnecessary churning by investors (see references detailed under point (x) in Appendix A). This is simple economics. If it costs to switch, less switching is to be expected. Also, investors that do not expect to switch may self-select into funds with high switching costs. In addition to the expense that it imposes on investors, another problem with raising switching costs is that they do not assure ongoing security of funding for the institution. It is hence a weak and, at best, partial solution.

One mechanism might be to impose switching fees within pooled vehicles that comprise two components: a cost-recovery charge related to the expense incurred by the fund provider to undertake the transaction, plus an excess charge that reflects the cost imposed by switching activity on other investors within the pool. The second component would be paid into the pool to be shared. The effect is that those redeeming units would not only incur the direct costs imposed on the fund as a consequence of the transaction, but they would also be effectively selling at a discount to their co-investors. The latter may seem like a wealth transfer; but this need not be the case to the extent that redemption activity can impose externalities on other investors. The literature demonstrates that liquidity-driven transactions can reduce returns for the remaining investors in pooled vehicles, as a consequence of market impact; see Edelen (1999) and Johnson (2004), amongst others. Further, redemption activity also imposes an opportunity cost to the extent that it inhibits long-term investing and investment in illiquid assets. Viewed in this way, an ‘excess’ switching charge might be considered a mechanism by which those who withdraw funding more fully bear the costs of the externalities they create.

5. **Conclusion**

We have considered how an investment organization might be designed to successfully pursue long-term investing. We put forward a variety of recommendations and suggestions. These are presented as actions that address four building blocks: orienting the organization, setting the right incentives, establishing a long-term investment approach, and harbouring discretion over trading. The discussion has been illuminated by insights and examples drawn from the Future Fund.

A number of key themes arise. Addressing the agency issues associated with multi-layered investment organizations is central. The aim is to ensure alignment. All involved should remain focused on long-term outcomes; and success should be appraised in these terms. It is critical that the organization is designed to foster this alignment, which in turn is reinforced in the processes by which outcomes are evaluated and rewarded. We highlight the importance of commitment; both in terms of funding, and the latitude provided to investment managers to follow their strategies through. Inevitably commitment entails costs, including the forfeiture of liquidity and increased exposure to agency risk, and henceforth trade-offs. We note the need to avoid making judgments based on the flow of short-term results, and how an element of trust is required, in order to give fund managers the encouragement and confidence to be long-term investors. Another key theme is the requirement for an investment approach that focuses on the long term. The investment philosophy, process and information used should all look beyond near-term market prospects, and address what will maximize long-term outcomes. In sum, long-term investing is about perspective and horizon: the sights should be squarely directed towards the long run.
APPENDICES

Appendix A: Ideas from the Literature

A plethora of ideas have been put forward for encouraging a lengthening of investment horizons in financial markets. This Appendix collects and summarizes these ideas under the 16 categories listed in Figure A1. This literature arises from public policy, industry and academic circles. Figure A1 identifies whether the idea in question relates to one of our building blocks, or to public policy. Our aim in this Appendix is to create a record, including setting out any related debate where appropriate. Needless to say, most commentators put forward a range of ideas that are often viewed as self-reinforcing. There is no ‘silver bullet’.

Figure A1: Sixteen Ideas for Extending Investment Horizons

<table>
<thead>
<tr>
<th>Idea:</th>
<th>Primarily Related to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Engineer the <em>organization</em> towards long-term investing</td>
<td>Organization / Approach</td>
</tr>
<tr>
<td>(ii) Orient investment <em>mandates</em> towards the long term</td>
<td>Organization / Approach</td>
</tr>
<tr>
<td>(iii) Improve manager <em>transparency and engagement</em> with investors</td>
<td>Organization</td>
</tr>
<tr>
<td>(iv) Apply ideas from <em>behavioural and organizational change</em> theory</td>
<td>Organization</td>
</tr>
<tr>
<td>(v) Employ the right <em>people</em></td>
<td>Organization</td>
</tr>
<tr>
<td>(vi) Alter how <em>performance</em> is evaluated</td>
<td>Organization / Incentives</td>
</tr>
<tr>
<td>(vii) Align <em>remuneration</em> structures</td>
<td>Incentives</td>
</tr>
<tr>
<td>(viii) Use <em>co-investment</em></td>
<td>Incentives</td>
</tr>
<tr>
<td>(ix) Exploit <em>commitment</em> mechanisms</td>
<td>Discretion Over Trading</td>
</tr>
<tr>
<td>(x) Raise <em>switching costs</em></td>
<td>Discretion Over Trading</td>
</tr>
<tr>
<td>(xi) Increase <em>information</em> on long-term value drivers</td>
<td>Investment Approach</td>
</tr>
<tr>
<td>(xii) Issue industry <em>practice guidance</em></td>
<td>Policy</td>
</tr>
<tr>
<td>(xiii) Re-jig the <em>regulation and policy</em> framework</td>
<td>Policy</td>
</tr>
<tr>
<td>(xiv) <em>Education</em></td>
<td></td>
</tr>
<tr>
<td>(xv) <em>Reward</em> long-term holders</td>
<td>Incentives / Policy</td>
</tr>
<tr>
<td>(xvi) Impose <em>penalties</em> for excess trading</td>
<td>Policy</td>
</tr>
</tbody>
</table>
(i) **Engineer the Organization Towards Long-Term Investing**

A core recommendation of many commentators is that investment management organizations should concentrate efforts on creating an environment to enable and support long-term investing. This entails orienting the whole organization towards long-term investing, including its mission, culture, governance, investment philosophy, investment processes, information sets and reward structures. Many commentators consider a capacity for contrarian investing to be an important component. Commentary along these lines is listed below.

- Gray (2006) says that *long-term thinking* needs to be embedded into the organization via its *mission and purpose*. He recommends only discussing long-term trend performance, and filtering out *information* to focus on that which is relevant to the longer term. Also, the *bias towards action should be removed* by ensuring that committees have the option to do nothing.

- Marathon (2007) specifically focuses on *governance*. The group recommends articulating *investment beliefs*, and setting *clear objectives with horizon over a full cycle*, e.g. 5-7 years. Atherton (2007c) also recommends that funds should set *guiding principles*.

- Another theme is the need to build organizational *resolve to ‘go against the crowd’*. This is suggested by Vaughan (1992); while Ang and Kjaer (2011) recommend that contrarian behaviour be institutionalized.

- Denison (2010) proposes that *governance* be configured to avoid focusing on short-term performance and peer comparisons; to build organizational understanding of long horizon valuations and risk; and to avoid short tenures for trustees or management. He recommends that the investment process should incorporate *long horizon valuation factors*.

- Much of the discussion in WEF (2011) focuses on the importance of **institutional design**, including the role of *investment beliefs*, institutional *risk appetite*, and various aspects of the *decision-making structure*. WEF (2011) also suggests that *internal management of investments* may assist with long-term investing, by improving alignment relative to what can be achieved using external managers.

- In a follow-up report, WEF (2012) considers *governance* in the context of long-term investing, and its links with *measurement of value, performance and risk*. Emphasis is placed on organizational *commitment* to a long-term investment program, supported by appropriate measurement that helps *protect the organization from short-term pressures* and is linked to remuneration. Other notable points include the central role for a *professional board*, the merit of *stable teams*; the value of a *critical perspective*; and the importance of *culture* and placing *trust* in those making investment decisions.

- Kay (2012) asserts that a *focus on the ‘right’ information* is needed. He suggests that the aim is to ‘reduce the value discovery horizon’, while increasing the *performance horizon*.

- Jones (2012) argues for **institutionalizing counter-cyclical behaviour** through decision and risk-management processes in the following ways:
  - managing communication and transparency, including anticipating loss periods (i.e. occasional drawdowns along the way) and reporting results in a long-term perspective;
  - using valuation-based rebalancing rules (in order to capture mean reversion);
  - building processes that distinguish long-term valuation or fundamental risks from short-term volatility; and,
  - being willing to hold cash when appropriate.

- Ambachtsheer (2014) maintains that institutions should act as *fiduciaries* with long horizons. He alludes to the importance of having a *clear stance* on investment goals and how they will be achieved; *autonomy to act*; and having a quality *board and management*. It is also important to balance *conviction and humility*.

- Barton and Wiseman (2014) emphasize the need to define long-term objectives including risk appetite; and that governance should be structured to support a long-term approach.
• Some commentators make an appeal for equity fund managers to change how they operate. Porter (1992) asks that investment managers place more weight on fundamental earnings power when selecting companies, take larger stakes, and decrease turnover. A panel at a Mercer conference (Reid, 2013) called for managers to modify their investment approach towards the long-term by increasing holding periods and engagement with companies.

• Some commentators state that leadership matters for driving change and establishing a long-term culture, see: CFA (2006); Atherton et al. (2007c); Marathon (2007).

(ii) **Orient Investment Mandates Towards the Long Term**

Many commentators see the investment mandate as a prime vehicle for establishing a principal-agent relationship that is better aligned with long-term investing. For instance, Papaioannou et al. (2013) call for a focus on mandates and associated incentives; while Drew (2009) sees the setting of investment mandates as a potential catalyst for change. PRI (2014) has issued a discussion paper that sets down six principles for long-term investment mandates, along with a request for further input. Listed below are some of the more specific ideas around how mandates might be designed in order to foster adoption of a longer horizon. While these ideas are formulated with external managers in mind, some are also relevant for the delegation of authority from the board to internal management.

• **Conceptual basis** – Both Kay (2012) and Ambachtsheer et al. (2013) suggest the relationship between managers and investors should be made more characteristic of a partnership, built on mutual trust and respect. Ang and Kjaer (2011) also mention creating alignment between asset owners and managers, but place more emphasis on contract design. Jones (2012) suggests contracts should focus mandates towards minimizing principal-agent time inconsistencies.

• **Longer contracts** – Establishing contracts with extended terms is a popular suggestion, see: Hewitt (2004); Atherton et al. (2007b, 2007c); Mercer (2010); Croce (2011); Ambachtsheer and Bauer (2013). Some even raise the idea that contracts should be based on the presumption of continuity, with termination clauses ‘like an employment contract’ (Hewitt; 2004; also Croce, 2011 and Reid, 2013). The aim is to send a signal of intention to maintain a long-lived relationship.

• **Suggestions arising from a competition** – Hewitt, Bacon & Woodrow conducted a competition for designing long-term mandates (see Hewitt, 2004). Notable ideas included adopting a focus on preservation of capital, use of inflation-plus absolute return targets, and writing restraints on turnover into the mandate.

• **Manager selection** – Some commentators direct attention towards the importance of selecting managers with long-term investment philosophies and alignment with the investor (e.g. Marathon, 2007). A recommendation appearing in Hewitt (2004) is to favour managers with a value investing philosophy, and to encourage more concentrated positions (also see Ambachtsheer and Bauer, 2013).

(iii) **Improve Manager Transparency and Engagement with Investors**

The concept behind increasing transparency and the level of engagement with investors is that it builds a deeper appreciation for decisions, which in turn can deflect attention from aspects that might encourage short-term actions. For instance, findings by researchers such as Lettau (1997), Sirri and Tufano (1998) and Huang et al. (2007) are consistent with the concept that increasing the scope of information provided can dent the propensity of investors to respond to short-term performance and marketing efforts. The basic idea is that managers should explain what they are doing and why. Stakeholders (principals) are more likely to stay along for the ride if they understand and buy into the decision processes, with the side-effect being that managers (agents) will feel more secure in pursuing a long-term approach. Observations and recommendations in line with this general theme are relayed below.

• Kay (2012) and Ambachtsheer et al. (2013) suggest that engagement should be based on relationships, rather than transactions, with an emphasis on building trust and respect. They suggest that greater transparency will help engender this trust.
Almost all managers interviewed by Mercer (2010) suggested the need to be clear about investment horizon with investors.

WEF (2011) calls for better communication with stakeholders, including promoting the understanding of long-term investing and stating clear investment beliefs both privately and publically. WEF (2012) signals out the board as potentially playing a role in sheltering the organization from external pressures to react during times of underperformance.

Aspen Institute (2009) recommends a higher level of accountability and disclosure on aspects like remuneration, trading, holdings and proxy voting. This should assist in building relationships and trust. WEF (2011) also argues for greater accountability.

ISA (2014) suggests that funds should disclose their long-term investments, along with putting forward the case for how they will benefit investors.

(iv) Apply Ideas from Behavioural and Organizational Change Theory

A number of commentators draw on the behavioural and organizational change literature for ideas on how to develop an environment conducive to long-term investing.

Irving (2009) discusses how some of the findings from behavioural research may assist in organizational design through building conscious barriers to opportunistic behaviour. One tactic is to identify where temporal trade-offs are being made; setting clear responsibility for managing these trade-offs; and ensure those responsible are not placed under undue stress. Framing and presentation is another consideration. For instance, query theory suggests that the onus should be placed on justifying ‘why should we be acting now?’, rather than ‘why should we be patient?’ Mental time travel techniques may be useful in some instances, by focusing the organizational vision towards long-term outcomes.

A number of suggestions arising from the myopic loss aversion literature are listed below. Many of the points overlap with suggestions for performance measurement; but also have implications for the design of governance:

- focus on long-term outcomes when reporting (Benartzi and Thaler, 1999)
- establish less frequent feedback and less opportunities to take action (Fellner and Sutter, 2009)
- encourage team decision-making (Sutter, 2007)
- require decisions to be explained (Vieider, 2011; Pahlke et al., 2012)

Laverty (1996, 2004) and Marginson and McAulay (2008) provide pointers on how organizations can help foster a long-term focus through building cultures and processes that achieve the following:

- establishment of a long-term vision;
- reduced the degree of ambiguity, which can be achieved through avoiding asking employees to make poorly-defined inter-temporal choices between the short and long term;
- improved information flow on progress towards long-term outcomes;
- build trust that outcomes achieved over time will remain the main focus, and that the employee will not have to constantly answer for short-term results;
- individuals should be encouraged to understand future opportunities, including viewing strategies as options.

Thaler and Shefrin (1981) suggest that imposing rules or limiting the range of discretion to make decisions may help overcome the tendency for lack of self-control to result in near-sighted actions.

Curran and Chapple (2010) refer to Thaler and Sunstein’s ‘nudge’ concept as an approach to influencing change, through identifying the values and frames that should be directly addressed.
(v) Employ the Right People

Vaughan (1992), Gray (2006) and Ambachtsheer (2014) all recommend employing people that have an affinity with or commitment to long-term investing. WEF (2011) states similar sentiments. WEF (2012) explicitly mentions the benefit of a professional, skilled board and talented well-staffed teams; and that both should ideally remain stable over time, through long tenures. Barton and Wiseman (2014) emphasize the importance of the board, stating that it should be independent, professional, possess relevant expertise, have the time available to be engaged, and be committed to a long-term investment philosophy. Gray (2014) emphasizes the importance of personality type for successful institutional investing.

(vi) Alter How Performance is Evaluated

Performance evaluation and remuneration practices are a prime focus across the literature. This section deals with performance evaluation. Remuneration practices are addressed separately in Section (vii).

- **Lengthening of evaluation periods** – A widely-offered recommendation is to lengthen the evaluation period, including the period over which performance is either reported and/or reviewed. However, there is an absence of consistency around what is considered to be an appropriate period. A panel at a Mercer conference in Melbourne (see Reid, 2013) recommended changing manager measurement periods from monthly or quarterly to yearly. Jones (2012) suggests yearly, if not longer; but emphasizes the importance of placing results in context (see below). G30 (2013) recommend conditioning bonuses on a performance measurement period of ‘no less than three years’; Rappaport (2005) suggests evaluation over three-five years; both Atherton et al. (2007b) and Ambachtsheer et al. (2013) suggest five year rolling periods; while WEF (2011, 2012) mentions either three, five, seven, or even ten years periods. ISA (2014) recommends considering reporting performance once every 6 months, while focusing on moving averages over 5-year or even 10-years. They also suggest devising a long-term risk measure with which performance evaluation may be coupled.

- **Report progress towards long-term goals** – Another idea is to change the focus when presenting performance towards reporting whether outcomes are on track to achieve long-term goals, rather than period-by-period returns. Performance would thus be reported in the context of some long-term target or broader objectives (Marathon, 2007; Jones, 2012; Kay, 2012), such as capital protection or adequate income in retirement (Chee and Cahill, 2014; Stewart, 2014). These ideas in part aim to address behavioural framing effects.

- **Emphasize absolute over relative performance** – Vaughan (1992) and Denison (2010) recommend that absolute performance should be emphasized over relative performance.

- **Focus on changes in fundamentals rather than prices** – WEF (2011) puts forward the idea of focusing on whether reported returns link to changes in underlying fundamentals or short-term price fluctuations. This idea very much aligns with our own discussion of the information set as presented in Paper 1 of this series, i.e. how long-term investor should be concerned with the drivers of long-term cash flows and returns, rather than short-term price changes. One variation proposed by WEF (2011) is to focus on concurrent changes in dividends or income. Another variation is to perform what they call ‘impairment estimates’, aimed at establishing whether the assumptions underpinning the investment remain valid. While WEF admit that such assessments are not clear-cut, they point out that they encourage a balance between promoting a long-term perspective and ensuring ongoing accountability. The three-component attribution appearing in Appendix B extends on these concepts.

- **Greater emphasis on qualitative reporting and evaluation** – Another direction is to deflect attention away from quantitative factors by placing greater emphasis on qualitative reporting, with the aim of engendering more transparency and trust in decision-making and how it links to outcomes (e.g. Marathon,

---

74 Voting by conference attendees on a range of ideas revealed this proposal as a clear favourite for “easiest to implement” and second for “most impact”, but also the least likely to happen.

75 Paper 1 discussed the behavioural influences on investment horizon.
This relates to the manner in which managers engage with investors, which was discussed under point (iii) above.

(vii) **Align Remuneration Structures**

Many commentators advocate designing incentive structures that are better aligned with the long-term interests of beneficial owners and long-term value creation, see: Hewitt (2004); CFA (2006); Gray (2006); Aspen (2007); Haldane (2010); Croce et al. (2011); Curran and Chapple (2011); WEF (2011, 2012); Kay (2012). A broad range of specific ideas have been put forward on how this might be achieved:

- **Basis of incentive component of remuneration** – Some commentators recommend that bonuses be based purely on long-term performance, e.g. Aspen Institute (2009); Kay (2012). Some suggest that manager fees be structured as a base intended to cover operating costs, plus a performance component that is aligned with the long-term benefit accruing to investors, see: Hewitt (2004); Marathon (2007). The latter further recommends that performance fees should involve ratcheting effects with ceilings or caps, risk-controls, and the use of high water marks.

- **Long-term vesting** – An alternative to basing bonuses on long-term performance involves accruing bonuses based on shorter-term performance, but only allowing them to vest conditionally over the long-term – possibly even carrying over into the post-employment period, see: Hewitt (2004); Rappaport (2005); CFA (2006); Atherton (2007b); Waitzer (2009); G30 (2013); Barton and Wiseman (2014). Indeed, G30 suggests vesting over 10 years, or even at retirement. Some advocate placing bonuses ‘at risk’ through claw-back provisions and the like, e.g. Hewitt (2004); Rappaport (2005); Waitzer (2009); WEF (2011). In addition, WEF (2011) notes that one way of placing bonus payments at risk is to invest them in a ‘parallel portfolio’ that shadows the major fund; while WEF (2012) mentions claw-backs and hold-backs.

- **Interesting variation on long-term vesting of accrued bonuses** – Seven eminent professors called the Squam Lake Group (2013) put forward an idea for structuring remuneration at systemically important financial institutions (SIFIs). This idea might be transferred with modification to an institutional investing context: refer Section 4(ii). Their idea involves paying a portion of bonus remuneration (e.g. 20%) in the form a bond that vests after a period of time (say 5 years), but is forfeited if the capital of the SIFI falls below a certain level.

- **Reward for fund or business success** – Some commentators suggest rewarding managers based on the success of the fund or business, in order to achieve better alignment. One idea is to pay bonuses in the form of a stake in the fund, see: Hewitt (2004); Kay (2012). Some managers interviewed by Mercer (2010) mentioned tying bonuses to organizational success rather than short-term returns, e.g. assets under management or team performance. We note that the notion of rewarding employees based on the success of fund management business may be questioned, as success at this level is not always aligned with the investor nor is it necessarily likely to lead to adopting a long horizon. Specifically, the success of a fund management business is more tied to assets under management, which in turn is only loosely connected to sustained, long-term performance.

- **Non-pecuniary benefits matter also** – WEF (2012) notes that some talented investment managers can be motivated by non-financial rewards such as alignment with the organizational mission, team ethos, shared sense of purpose, and scope for learning.

It is worth observing that **performance bonuses raise their own issues**. Rappaport (2005) queries whether performance fee components may have the consequence of encouraging managers to take on unacceptable risk. We also add that basing bonuses on long-term performance with ratchets can have unintended implications when a manager is lagging. For instance, it can encourage taking on more risk to catch up. Alternatively, being well behind may undermine incentive for effort; while creating an inducement to leave and set up shop elsewhere, to reset the counter. These types of considerations mean that while altering the structure of performance incentives may help, it is no panacea.
(viii) **Use Co-investment**

Co-investment is perhaps one of the best ways to ensure alignment between managers and investors. Commentators who appeal for greater use of co-investment include Rappaport (2005), CFA (2006), Atherton et al. (2007b) and Marathon (2007). The WEF (2011) idea of investing bonus payments in a ‘parallel portfolio’ is also a form of co-investment. WEF (2012) points to the benefits of ‘carried interest’ and parallel investment as used in private equity. The finding by Cella et al. (2013) that churn ratios were significantly lower when a founder is present within the fund’s management is suggestive of the concept that managers with skin in the game might be more inclined to adopt a long-term perspective.

(ix) **Exploit Commitment Mechanisms**

Commitment mechanisms (Strotz, 1956) can have implications for two of the drivers of investment horizon that were discussed in Paper 1. First, by providing self-discipline, commitment can over-ride some of the behavioural tendencies towards short-termism (see Thaler and Shefrin, 1981). Second, commitment can assist with securing funding sources. Henceforth, it may give managers greater discretion over trading, and thus latitude to focus on long-term. The potential role for commitment mechanisms is mentioned by Haldane (2010). The basis on which they might work has been established by a number of commentators:

- **Locking the funds away** – Laibson (1997) discusses the role of ‘golden egg’ investments, where the payoffs are delayed and cannot be readily accessed in the interim. He notes that by acting as a commitment mechanism, such investments can overcome a lack of self-control and counter the effects of hyperbolic discounting. Getting investors to commit for the long term has the effect of requiring them to adopt a long-term perspective.

- **Offering commitment may suffice** – Evidence exists that investors may be openly willing to enter into commitment arrangements if they are made available. Sourdin (2008) finds that sophisticated households which demonstrate time-inconsistency are more likely to favour illiquid superannuation investments, which aligns with the view that they value commitment. Thaler and Benartzi (2004) report on the pilot for a savings commitment plan, where workers pre-committed to allocate their wage increases towards retirement savings. Many workers opted to take up the scheme, and increased their savings over time as a consequence. Few opted out, despite the fact that they could readily do so.

- **Form of commitment mechanisms** – In an institutional investing context, commitment mechanisms can take the form of either investments or fund structures where the money is locked away for an extended period and cannot be accessed except at significant cost. Sourdin (2008) suggests that illiquid assets play this role to some degree, implying that if investors committed to more illiquid assets then horizons would increase by necessity. A more obvious solution is to make greater use of closed-end structures (see Stein, 2005; Cherkes, 2012). Another alternative is to place greater constraints on the ability to redeem funds in circumstances where immediate liquidity is not germane to the investment being made. For instance, any watering down of member investment choice or portability in the case of superannuation funds might be seen as a commitment mechanism. A solution put forward by ASFA (2014) is to explicitly lengthen redemption terms. Similarly, ISA (2014) suggests establishing investment options that members are unable to redeem for some years, perhaps with some reward attached. ISA envisages that these options could exist alongside liquid accounts which provide redemption facilities for those who need it.

**While commitment mechanisms may assist in extending investment horizons, they come at a cost.** First, investors would be forfeiting liquidity which is valuable. Second, it may heighten exposure to agency risk. Commitment to the manager – for better or for worse – is required to foster a long-term focus. Any such commitment leaves the investor exposed to the risk of being stuck with a poor manager. This issue was discussed in Section 2, and arises in the literature on open-end versus closed-end funds. Both Rappaport (2005) and Stein (2005) note the concern with closed-end funds of being locked into a bad manager, with the only recourse being to sell at a steep discount to NTA. This risk may be partly responsible for the closed-end fund discount. Rappaport sees the challenge for closed end funds is to develop incentives that will attract the best managers.
A variation on commitment is to combine it with co-investment. The aim here would be to address the agency risk associated with committing to a manager for the long run. Although this would not guarantee that the manager will be skilled, it at least will help ensure that they are aligned and properly incentivised to generate long-term value for investors. Related fund structures include long-term capital funds or partnerships with managers (Hewitt, 2004; CFA, 2013).

(x) Raise Switching Costs

If full commitment is not possible, then imposing switching costs may help to generate ‘stickier’ funds. Nanda et al. (2000) suggest that skilled managers might charge an exit fee to attract investors with low liquidity needs, and hence limit the expected costs of meeting redemptions. Johnson (2004) suggests considering utilizing loads, redemption fees or transaction fees to help inhibit the switching activities of mutual fund investors. Chordia (1996) also argues that loads facilitate more illiquid holdings and by implication long-term investing, by discouraging redemption and attracting investors that are less likely to redeem in the initial instance. The notion that switching costs can have an influence on fund flows is consistent with the findings of Huang et al. (2007).

(xi) Increase Information on Long-Term Value Drivers

Some commentators take the stance that long-term investing may be encouraged through the type of company information that is made available. The assumption is that more long-term information will influence the manner in which investments are evaluated. One idea is to shift the emphasis towards providing more information on long-term value drivers. This idea aligns with the concept raised in Paper 1 that investment horizon is closely related to the information sets employed. While typically discussed in the context of listed companies, the concept is a general one with broader implications that could apply across asset classes. Listed below are some of the comments and recommendations relating to this theme.

- Companies should provide more information on strategy and long-term drivers of value – This concept is raised by Vaughan (1992), Atherton et al. (2007b, 2007c), Aspen (2007), and Curran and Chapple (2010). It was also raised at a symposium run by the CFA Institute (CFA, 2006). Rappaport (2005) and Atherton et al. (2007b, 2007c) appeal for enhanced disclosure of both non-financial information and earnings drivers.

- De-emphasize quarterly earnings – Various calls have been made to limit the tendency to concentrate on quarterly earnings reports. Ambachtsheer and Bauer (2013) report that one of the recommendations arising from a pension executive workshop was to shift the focus from quarterly to yearly earnings. Kay (2012) suggests that companies should de-emphasize quarterly reporting, and that quarterly reporting should be optional, rather than mandatory. However, not all commentators agree that removing quarterly reporting requirements would be beneficial. For instance, Porter (1992) and Vaughan (1992) contend that eliminating quarterly reporting will make investors less informed.

- Encourage more long-term research from analysts – Atherton et al. (2007b, 2007c) propose finding a way to make more long-term research available from company analysts; although they acknowledge that a supportive business model is required to encourage this type of research. Another idea is an enhanced analytic initiative, which involves creating a pool to fund long-term research.

- Too much information – Kay (2012) discusses the quantum of information in some depth, warning that more data can increase cognitive biases such as optimism bias, anchoring and loss aversion by increasing noise. Kay raises this more as an observation than a recommendation to reduce information flow. Kay’s main recommendations are around reduced use of quarterly earnings, plus a plea for more informative, narrative-based reporting. WEF (2012) notes the dangers of making too much information available, and recommends focusing on a limited number of metrics needed for decisions. On the other hand, care needs to be taken in limiting the information that is made available, as this may result in elimination of relevant information. (It may be better to filter.)
(xii) **Issue Industry Practice Guidance**

Some commentators recommend making an attempt to overtly shift industry practice guidance towards the long-term. G30 (2013) make the general comment that *industry guidelines* may play a role, while noting that the impact is less certain than changes in public policy. Specific ideas include:

- Establish *codes of conduct* that emphasize stewardship over speculation, see: Atherton et al. (2007b, 2007c); Kay (2012); Reid (2013); Woolley (2013). Ambachtsheer et al. (2012) refer to the introduction of stewardship codes in the UK and Europe during 2012. Japan issued a stewardship code modeled on the UK version in February 2014.

- Ambachtsheer and Bauer (2013) recommend the establishment of a *model investment mandate*. PRI (2014) is developing principles for long-term investment mandates.

- Atherton et al. (2007b, 2007c) suggest developing *accreditation schemes*.

(xiii) **Re-jig the Regulation and Policy Framework**

There are various proposals for changes to the regulatory framework to help foster longer-term investing. In particular, Croce et al. (2011) highlight a number of steps that authorities may take globally:

- Address the bias towards procyclicality and short-term risk management in *solvency and funding regulations* (also suggested by WEF, 2011; G30, 2013; Papaioannou et al., 2013). In addition, WEF (2011) puts forward the idea of perhaps differentiating how the regulations are applied, depending on whether the related liability is short-term or long-term in nature;

- Promote *professionalism and expertise in governance of institutions*;

- *Encourage resource pooling to support scale* in investment management, thus permitting smaller investors to access a wider range of (long-term) investments;

- Provide a ‘nudge’ by *changing the focus of regulatory investigations* towards aspects like turnover, mandates, fees structures, voting behaviour, and so on;\(^\text{76}\)

- *Support investing in long-term assets through policy planning*, making assets available, providing tax incentives, and fostering of risk-transfer opportunities (also suggested by Haldane, 2010).

In **Australia**, calls have emerged to reconsider the requirements related to liquidity and portability, which are viewed as combining with member investment choice to act as a barrier to long-term investing by superannuation funds. Point (ix) observed that ASFA (2014) recommends explicitly lengthening redemption terms; while ISA (2014) calls for permitting investment options that members are unable to redeem for some years. ASFA (2014) also recommends reassessing the ways in which pooled funds are required to manage illiquidity risk, including relaxing liquidity requirements for products invested in by younger investors and setting liquidity limits based on historical assessment of investor redemption behaviour. ISA (2014) further proposes adjusting fair-value accounting methods to accommodate valuing assets in a manner more consistent with long-term value. The underlying notion is that a disconnect can exist between fundamental value and market prices, with the latter potentially being distorted to the extent that they are sentiment-based and volatile. ISA also offers the idea of establishing industry-wide dates at which switching between investment options is permitted to occur.

ISA (2014) further float the related idea of establishing a *public liquidity facility*. ISA argue that the evaluation of liquidity by regulators on a fund or even investment option basis leads to excessive liquid asset holdings across the entire system, and acts to restrict the capacity of funds to hold illiquid, long-term assets. They suggest that a public liquidity facility (similar to repo transactions) may help reduce this barrier to long-term investment.

\(^\text{76}\) Kay (2012) recommends that regulators be less prescriptive and exercise more informed judgment.
In *Europe*, a number of recent regulatory developments are worth noting that are aimed at influencing investment horizons (see KPMG, 2014):

- Under *UCITS V*, at least 50% of variable remuneration must be paid in shares of the managed UCTIS funds; while 40% (and up to 60% for large amounts) must be deferred for at least three years;

- Under the *Alternative Investment Fund Managers Directive (AIFMD)*, assessment of performance should occur over a number of years as appropriate to the fund lifecycle; and the variable remuneration component is subject to equivalent requirements as those specified under UCITS V;

- The European Commission is examining the establishment of *European Long-Term Investment Funds (ELTIFs)*, a new framework where funds are committed to companies or projects for the long term.

(xiv) **Education**

Some commentators call for education of investors, new industry employees, and the media to assist in developing a long-term focus and culture, see: CFA (2006); Atherton et al. (2007b, 2007c); Croce et al. (2011). Ang and Kjaer (2011) argue that upgrading the investment competence of owners may help foster alignment between asset owners and managers.

(xv) **Reward Long-Term Holders**

Some participants in the debate over the link between investor short-termism and corporate myopia have proposed incentives for investors to retain their shares for longer periods. Ideas include rewarding long-term holders with either loyalty shares, additional dividends and/or voting power, see: Atherton et al. (2007b, 2007c); Aspen Institute (2009); Gore and Blood (2012); Bolton (2013); ISA (2014). Arguments for and against loyalty dividends are discussed by Duruigbo (2011).

(xvi) **Impose Penalties for Excess Trading**

Another idea is to impose some kind of penalty on excess trading. Specific suggestions include:

- *Transaction taxes* (see Mercer, 2010; Reid, 2013);

- *Differential short-term capital gains taxes* (Atherton et al., 2007b; Aspen Institute, 2009.) ISA (2014) extends this idea by suggesting a sliding scale for capital gain tax rates as a function of holding period, as well as potentially applying differential rates to pure financial instruments versus provision of capital for real economic investment;

- *Holding period levies* (Haldane, 2010);

- *Direct trading restrictions and/or penalties* for excess trading (see Hewitt, 2004; Atherton et al., 2007b; Woolley, 2013);

- *Restrict hedge fund trading* (suggested by some managers interviewed by Mercer, 2010);

- *Monitor manager holding periods* (Hewitt, 2004; Croce et al., 2011), which should be supported by reporting of turnover levels (WEF, 2011; ISA, 2014), and might be viewed as an implied penalty.

The efficacy of imposing penalties on trading is disputed. For instance, Porter (1992) suggests that taxing transactions could make markets less efficient. Duruigbo (2011) further discusses the arguments for and against penalties on trading.
Appendix B: NPV-Based Performance Evaluation

This Appendix presents an approach to performance evaluation that disentangles the effect of cash flows and discount rates on realized returns. Although our primary focus is performance attribution, the approach also implies a decision-making structure whereby the projection of long-term cash flows and expected returns is unbundled from asset selection, and each may be performed as separate functions. Under the approach, long-term cash flow projections are formed that lead to estimates of long-term expected returns as the internal rate of return equating future cash flows with price. Expected cash flows and expected returns then form the benchmark against which subsequent returns are attributed into cash flow and discount rate effects. Asset selection is based on comparing estimated expected returns with the required return. Our approach facilitates long-term investing by placing long-term cash flows and expected returns at the centre of both the investment process and subsequent performance evaluation, abstracting from short-term price fluctuations that arise from the impact of discount rate changes.

The attribution approach entails dividing realized return over a period into three components:

1. Expected return at the commencement of the period
2. Changes in expected returns, or discount rates
3. Changes in expectations for future cash flows

After providing some initial background, we formally set out the approach. It is then illustrated with a worked example. This is followed by a closing discussion which sets out the potential links to investment process, highlights some implementation issues; and observes certain problems with the approach.

Background

The foundation of our approach is the proposition of Paper 1 that the basis of long-term investing is prediction of long-term cash flows and expected returns, and not near-term price fluctuations. The approach recognizes that variations in discount rates are an important driver of short-term price fluctuations; yet are less important than long-term cash flow generation when investing over long horizons (see analysis in Paper 1). Our approach aligns with and builds on a recommendation made by WEF (2011), who state: “Long-term investors looking to evaluate investments in the interim can look for indications of potential future performance that are not based solely on the current market price. For example, some investors track the dividend payments and income of an investment to determine if a change in the market price reflects a more fundamental change in the economic value of the asset.”

Division of returns into cash flow and discount rate components has been a feature in the asset pricing literature for some time, with Campbell and Shiller (1998) providing a seminal contribution. Two notable examples include Campbell and Vuolteenaho (2004), who re-examine the capital asset pricing model by dividing beta into ‘cash flow beta’ and ‘discount rate beta’; and Hecht and Vuolteenaho (2006), who analyze stock returns by estimating the same three components as listed above. Cochrane (2011), in his Presidential Address to the American Finance Association, acknowledges the value of delineating returns into cash flow and discount rate components, arguing that fluctuations in discount rates may be able to explain many asset pricing relations. Hence explaining realized returns as a consequence of the combination of fluctuations in the numerator (i.e. expected cash flows) and the denominator (i.e. discount rates) in the net present value (NPV) equation has ample precedent and is soundly based in the theory of finance.

In an important and related contribution, Cochrane (2014) develops a model of asset pricing and portfolio construction where assets are represented as a claim over a stream of expected long-term cash flows. Cochrane argues that there is considerable benefit in abstracting from the complications of dynamic portfolio strategy by separating out and focusing on payoffs (i.e. cash flows) alone. His underlying argument is that dynamic optimization is computationally hard, poorly understood and rarely used. Focusing on payoffs is a

---

77 Cochrane assumes preferences over mean and variance (i.e. quadratic utility) in order to derive asset pricing relations in closed form.
convenient way to simplify the problem. Cochrane’s approach amounts to a long-term multi-period analysis. It takes a step away from the usual practice of examining single-period returns. Dynamic strategies in response to time-variation in expected returns and hedging of the changes in the investment opportunity set do not appear under Cochrane’s specification; although he notes that dynamic strategies might be analyzed as a separate payoff stream. The performance evaluation method presented here may be considered the attribution analysis counterpart of Cochrane’s approach, where expectations for future cash flows (i.e. payoffs) form the fundamental basis for investment.

The objective of attribution analysis (see Bodie et al., 2014, pp864-870) is to identify the contributions to active portfolio returns, usually relative to a benchmark. The typical focus is on isolating the contribution from aspects such as asset allocation, sector and security selection, or market timing. Our approach is a form of attribution analysis that aims to estimate the contribution from three components of opening expected return, changes in discount rates and changes in expected cash flows. It is motivated by, and consistent with, the body of literature on cash flows versus discount rate effects referred to above. Nevertheless, the approach can still accommodate the estimation of contributions along asset, sector or security lines through simply summing along these dimensions.

Under our attribution approach, the first component of expected return at the beginning of a period forms a reference point. The other components capture the two ways in which return realizations may differ from the expected return: changes in expected cash flows, and changes in discount rates. The presumption is that changes in cash flows are of primary interest under long-term investing. Revisions to cash flow projections represent a fundamental change in value, and hence the returns that are achievable from an investment held over the long-term. If the entire future cash flow stream changes by 10%, then underlying value changes by 10%, and this flows into long-term returns. Cash flow changes are intimately related to the notion of risk as a ‘permanent loss of wealth’; and the discussion in Paper 2 that identifies mis-estimation of long-term value and expected returns as a key pitfall in long-term investing.

While changes in discount rates also influence realized returns, from the perspective of a long-term investor they can be viewed as a ‘re-ordering’ of the sequence in which the returns are earned. If the discount rate goes up, a capital loss is incurred initially, but higher returns are subsequently earned off the lower price base. The equivalent happens when a (zero cash flow risk) sovereign bond is held to maturity, but bond yields fluctuate along the way. Although the return through to maturity is given at the time of purchase, fluctuations in bond yields in the interim impact on the market price of the bond. Nevertheless, the total return earned to maturity remains the same. Only the pattern of returns over time has changed.\(^78\)

**Derivation**

We now formally derive our return attribution measures. While the derivation is with respect to a single asset, it is straightforward to aggregate across a portfolio and sub-groups of assets by applying asset weightings. This will be demonstrated in the worked example.

The starting point for our derivation is equation (A1), which is an expression for the realized return on an asset during period \(t\). For convenience, ‘cash flow’ \((CF)\) – which might be thought of as the distributable free cash flow generated by the asset over the period – is folded back into the total value at the end of the period \((V_t)\). Implicitly this assumes “dividend irrelevance” (see Miller and Modigliani, 1961).

\[
R_t = \frac{P_{t-1} + CF_t}{P_{t-1}} - 1 = \frac{V_t}{P_{t-1}} - 1 \tag{A1}
\]

Where:
- \(R\) = Return
- \(P\) = Price

\(^{78}\) Of course, fluctuations in bond yields and prices are not necessarily totally irrelevant, as they may imply an opportunity cost (or benefit) in timing of purchases. This relates to dynamic strategies, which were discussed in Paper 1 and Paper 2.
Equations (A2), (A3) and (A4) establish the link between value and the NPV equation. Equation (A2) is in the form of a standard NPV equation, except that for our purposes the discount rate \((DR_0)\) is estimated conditional on \(P_{t-1}\) (i.e. asset price) and expected future cash flows at \(t-1\). Effectively \(DR_0\) is the internal rate of return (IRR) which equates future expected cash flows with price at the beginning of period \(t\). It is a measure of the long-term expected return at that time.\(^79\) Equation (A3) is the equivalent for the end of period \(t\), in which case \(DR_t\) is the IRR conditional on expected cash flows that may have been revised during period \(t\). Note that the exponent on the denominator in equation (A3) is \(t-1\), which has the effect of reducing the discount rate applied to each cash flow term, including applying a discount rate of 1 to \(CF_t\).\(^80\) Equation (A4) represents the expectation at period \(t-1\) for value at the end of period \(t\), under the assumption that neither cash flow expectations nor the discount rate change. This equals the price at the beginning of the period multiplied by one plus the discount rate. The key takeaway is that realized return will equal the discount rate in the absence of any changes in expected cash flows or the discount rate.\(^81\)

\[
P_{t-1} = \sum_{t=1}^{\infty} \frac{E_0[CF_t]}{(1+DR_0)^t} \tag{A2}
\]

\[
V_t = \sum_{t=1}^{\infty} \frac{E_1[CF_t]}{(1+DR_1)^{t-1}} \tag{A3}
\]

\[
E_0[V_t] = \sum_{t=1}^{\infty} \frac{E_0[CF_t]}{(1+DR_0)^{t-1}} = V_{t-1}(1 + DR_0) \tag{A4}
\]

Where:
- \(DR\) = Discount rate = internal rate of return (IRR)
- \(0, 1\) = Indicator for beginning and end of period \(t\), where \(0 = \) period \(t-1\) and \(1 = \) period \(t\)
- \(E[j]\) = Expectations operator

Having established the framework, we now restate the return during period \(t\) \((R_t)\) into our three components. The first step is a recasting of equation (A1) by incorporating two offsetting terms in the numerator for expected value at the end of the period:

\[
R_1 = \frac{E_0[V_t] + V_t - E_0[V_t]}{P_{t-1}} - 1 \tag{A5}
\]

Substituting equations (A2), (A3) and (A4) into (A5) produces equation (A6):

\[
\text{(A6)}
\]

\(^79\) Two points to note about IRR estimated in this manner. First, IRR implicitly assumes reinvestment of cash flows at the discount rate. Second, no allowance is made for expected time-variation in discount rates, i.e. any term structure for expected returns. The main implication is that IRR may vary from expected effective returns to the extent that an investor anticipates reinvesting cash flows at a different rate to the IRR. This issue is of limited consequence for the attribution analysis, which is being applied over a single period, during which reinvestment of cash flows is likely to be a minor influence on realized returns. However, it may be more of an issue for the integrity of the long-term expected return estimates, if these are to be used in asset selection. Nevertheless, while IRRs have potential to distort the magnitude of expected effective return to the extent that the reinvestment rate varies from the discount rate, it should leave the ranking of assets by expected return unaffected.

\(^80\) Although \(CF_t\) (i.e. \(CF_1\)) is known at the end of period \(t\), we nevertheless retain the expectations operator to simplify the presentation.

\(^81\) This also assumes that any cash flows are reinvested at the discount rate, \(DR_0\)
\[ R_1 = \frac{P_{t-1}(1+DR_0)}{P_{t-1}} + \sum_{t=1}^{\infty} \frac{E_t[CF_t]}{(1+DR_1)^{t-1}} - 1 \quad (A6) \]

Rearranging:

\[ R_1 = \frac{P_{t-1}(1+DR_0)}{P_{t-1}} - 1 + \sum_{t=1}^{\infty} \frac{E_t[CF_t] - E_0[CF_t]}{(1+DR_1)^{t-1}} - \frac{E_0[CF_t]}{P_{t-1}} \quad (A7) \]

Finally, collecting terms and defining \( E_0[R_1] = DR_0 \) as the expected return over period 1, leads to equation (A8). This is our attribution equation and key result:

\[ R_1 = E_0[R_1] + \sum_{t=1}^{\infty} \frac{E_t[CF_t] - E_0[CF_t]}{(1+DR_1)^{t-1}} - \frac{E_0[CF_t]}{P_{t-1}} \quad (A8) \]

In equation (A8), the first term is the ‘expected return’, which equals the discount rate or IRR applying at period 0 (i.e. beginning of period 1). \( E_0[R_1] \) is the return that would be forthcoming under conditions where neither the discount rate nor expected cash flows are revised. The second term captures the contribution from revisions to the discount rate or the IRR. It is estimated as the change in present value at the end of period 1 that arises from the discount rate moving from \( DR_0 \) to \( DR_1 \), based the cash flows as expected at the end of period 0. The third term captures the contribution from revisions to expected cash flows, incorporating the realized cash flow for period 1. It is estimated as the impact of cash flow revisions on present value at the end of period 1, evaluated using the prevailing discount rate at the time, \( DR_1 \). The second and third terms are both scaled by the opening price, \( P_{t-1} \). The three components sum to realized returns by construction.

**Worked Example**

Figure B1 provides a worked example. The asset universe comprises five assets: three ‘risky’ assets with uncertain cash flows, a government bond and cash. Items are numbered (1) through (15) in the table for reference. Under item (6) are the forecasts for expected cash flows as at period 0 (panel A) and period 1 (panel B). We provide forecasts over 5 periods, with a continuing value (CV) at the end of period 5. The latter is estimated for the three risky assets using a standard constant growth discount model, the assumptions for which are listed under item (7). The government bond is assumed to mature at the end of period 5. With regard to cash, the cash flows reflect the expectations for the returns from investing in cash on a ‘roll-over basis’ (see Warren, 2007) over the horizon. Cash is something of a special case because it has no price risk, and its treatment will be explained as we proceed.

Item (2) is the discount rate (\( DR \)) or IRR conditional on the cash flow forecasts and the observed price. The calculation is straightforward for all assets except cash. For cash, \( DR \) equals the average expected return from holding cash over the forecast horizon. Note that the reported \( DR_0 \) for cash of 3.0% varies from the 2.5% cash rate over period 1. The \( DR \) estimates perform two functions. First, \( DR_0 \) is the long-term expected return at the beginning of period 0, which is the first of the three components in our attribution. Second, \( DR \) can support asset selection in the manner explained in the next paragraph.
## Figure B1: Three Component Attribution

### A) PERIOD 0

<table>
<thead>
<tr>
<th>Weight for Period 1</th>
<th>( DR_0 )</th>
<th>Required Return, ( RR )</th>
<th>Excess Return ( DR_0 - RR )</th>
<th>Price ( P_0 )</th>
<th>Expected Cash Flows per Period</th>
<th>Continuing Value at end-Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>( E[R] )</td>
<td>( \Delta DR )</td>
<td>( \Delta E[CF] )</td>
<td>( \Delta )</td>
<td>( \Delta )</td>
<td>( \Delta )</td>
<td>( \Delta )</td>
</tr>
<tr>
<td>Risky Asset 1</td>
<td>35%</td>
<td>12.3%</td>
<td>10%</td>
<td>2.3%</td>
<td>250</td>
<td>10.0</td>
</tr>
<tr>
<td>Risky Asset 2</td>
<td>35%</td>
<td>9.4%</td>
<td>8%</td>
<td>1.4%</td>
<td>200</td>
<td>10.0</td>
</tr>
<tr>
<td>Risky Asset 3</td>
<td>0%</td>
<td>9.3%</td>
<td>12%</td>
<td>-2.7%</td>
<td>400</td>
<td>10.0</td>
</tr>
<tr>
<td>Government Bond</td>
<td>20%</td>
<td>4.0%</td>
<td>4.0%</td>
<td>0.0%</td>
<td>100</td>
<td>4.0</td>
</tr>
<tr>
<td>Cash</td>
<td>10%</td>
<td>3.0%</td>
<td>3.0%</td>
<td>0.0%</td>
<td>100</td>
<td>2.5</td>
</tr>
<tr>
<td>Portfolio Total (per $1)</td>
<td>1.00</td>
<td>8.7%</td>
<td>7.4%</td>
<td>1.3%</td>
<td>1.000</td>
<td>0.042</td>
</tr>
</tbody>
</table>

### B) PERIOD 1

<table>
<thead>
<tr>
<th>Weight for Period 2</th>
<th>( DR_1 )</th>
<th>Required Return, ( RR )</th>
<th>Excess Return ( DR_1 - RR )</th>
<th>Price ( P_1 )</th>
<th>Expected Cash Flows per Period</th>
<th>Continuing Value at end-Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>( E[R] )</td>
<td>( \Delta DR )</td>
<td>( \Delta E[CF] )</td>
<td>( \Delta )</td>
<td>( \Delta )</td>
<td>( \Delta )</td>
<td>( \Delta )</td>
</tr>
<tr>
<td>Risky Asset 1</td>
<td>35%</td>
<td>16.3%</td>
<td>10%</td>
<td>6.3%</td>
<td>220</td>
<td>9.0</td>
</tr>
<tr>
<td>Risky Asset 2</td>
<td>0%</td>
<td>5.4%</td>
<td>8%</td>
<td>-2.6%</td>
<td>250</td>
<td>10.2</td>
</tr>
<tr>
<td>Risky Asset 3</td>
<td>35%</td>
<td>20.0%</td>
<td>12%</td>
<td>8.0%</td>
<td>300</td>
<td>10.0</td>
</tr>
<tr>
<td>Government Bond</td>
<td>10%</td>
<td>2.7%</td>
<td>4.0%</td>
<td>-1.3%</td>
<td>105</td>
<td>4.0</td>
</tr>
<tr>
<td>Cash</td>
<td>20%</td>
<td>2.9%</td>
<td>3.0%</td>
<td>-0.1%</td>
<td>100</td>
<td>2.5</td>
</tr>
<tr>
<td>Portfolio Total (per $1)</td>
<td>1.00</td>
<td>13.5%</td>
<td>8.7%</td>
<td>4.8%</td>
<td>1.000</td>
<td>0.035</td>
</tr>
</tbody>
</table>

### C) ATTRIBUTION

| Risky Assets (per $1) | \( E[R] \) | \( \Delta DR \) | \( \Delta E[CF] \) | \( \Delta \) | \( \Delta \) | \( \Delta \) | \( \Delta \) | \( \Delta \) | \( \Delta \) | \( \Delta \) | \( \Delta \) |
|-----------------------|-----------|----------------------|-------------------|-------------|-----------------------------|-----------------------------|
| Return for Period 1   | \( E[R] \) | \( \Delta DR \) | \( \Delta E[CF] \) | \( \Delta \) | \( \Delta \) | \( \Delta \) | \( \Delta \) | \( \Delta \) | \( \Delta \) | \( \Delta \) | \( \Delta \) |
| Risky Asset 1 | -8.4% | 12.3% | -13.4% | -7.3% | -5.0% | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -26.5 | -33.4 | -18.3 |
| Risky Asset 2 | 30.1% | 9.4% | 15.7% | 5.1% | 6.4% | 0.2 | 0.3 | 0.5 | 0.5 | 0.5 | 10.3 | 31.3 | 10.1 |
| Risky Asset 3 | -22.5% | 9.3% | -31.8% | 0.0% | -2.7% | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -127.4 | 0.0 |
| Government Bond | 9.0% | 4.0% | 5.0% | 0.0% | | | | | | | 5.0 |
| Cash | 2.5% | 3.0% | 0.4% | 0.0% | | | | | | | 0.4 |
| Portfolio Total (per $1) | 9.6% | 8.7% | 1.8% | -0.8% | 0.5% | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.019 | 0.018 | -0.008 |

## Change in Expected Cash Flow

<table>
<thead>
<tr>
<th>( \Delta Value ) End-Period 1 Due To:</th>
<th>( \Delta DR )</th>
<th>( E[CF] )</th>
<th>( \Delta E[CF] )</th>
<th>( \Delta )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risky Assets (per $1)</td>
<td>10.9%</td>
<td>10.8%</td>
<td>1.1%</td>
<td>-1.1%</td>
</tr>
</tbody>
</table>
To facilitate asset selection, a required return is specified for each asset: these appear under Item (3). Item (4) is the difference between the expected return (i.e. DR) and the required return. This measures the extent to which an asset offers a long-term excess expected return. The portfolio manager would form their portfolio with reference to these excess returns. Item (1) provides some notional portfolio weights. For period 1, the portfolio manager has decided on a weighting of 35% in risky asset 1 and 35% in risky asset 2, but 0% in risky asset 3 which offers a negative excess expected return. Bonds and cash offer returns in line with required returns, and are allocated 20% and 10% respectively. The asset allocation for period 1 provides the weights by which the asset attributions are aggregated. By the end of period 2, changes in prices and expected cash flows result in risky asset 2 and bonds becoming less attractive, while risky asset 3 now offers attractive excess returns following a sell-off. The portfolio manager responds by adjusting the portfolio weights for period 2 to reflect the updated long-term return expectations, switching from risky asset 2 to risky asset 3 and transferring some funds from bonds to cash.

Panel C presents the attribution of returns for period 1. Item (8) reports the realized returns for each asset and the portfolio. Our three component attribution appears as items (9), (10) and (11). It reveals that portfolio returns were boosted by changes in discount rates, which contributed +1.8% to total portfolio return and +1.1% to the return in the risky asset component of the portfolio. The effect of changes in discount rates on asset values is reported under item (14). (Note: The deviation of cash returns over the period from the expected long-term return on cash is treated as a discount rate effect.) By contrast, changes in expected cash flows subtract -0.8% from total portfolio return, and -1.1% from the return on the risky asset component. Changes in expected cash flows for each asset are reported under item (13), and the total effect on asset values is summarized under item (15). Large downward revisions to cash flows for risky asset 1 more than offset the modest upward revisions for risky asset 2.

Item (12) compares the difference between the sum of the contribution from expected return and changes in expected cash flow, and the required return. This represents the excess return realized over the period, abstracting from the effect of changes in discount rate. It is the key measure of the generation of long-term excess returns. On this measure, the total portfolio generates a positive increment of 0.5% over the required return for the period. Although this is lower than the 1.3% excess return that was expected at the beginning of the period (see item (4)), it is nevertheless positive. This indicates that value has still been added, albeit less than expected at the outset, and less than suggested by the total portfolio return. Hence the portfolio manager may still deserve a bonus, but a lesser one than would be implied by traditional return-based performance evaluation. Ideally item (12) would be examined over multiple periods, after which there should be greater visibility on whether expected cash flow forecasts are actually achievable.

The attribution analysis reveals that the portfolio generated returns that benefited from fortuitous price fluctuations arising from reductions in discount rates. Meanwhile, the risky assets that were selected – most notably risky asset 1 – suffered a substantial downward revision in expected cash flows and hence attenuation of the long-term return that may be eventually realized. To the extent that the aim is to reward managers of long-term investment funds for correctly forecasting long-term return potential rather than short-term price fluctuations, any bonus might be calibrated accordingly.

**Discussion**

The derivation and worked example provide a general sense for not only how the approach feeds into performance evaluation, but also how it may form part of a long-term investment process. In terms of the latter, the analysis points towards two separate functions. The first function involves forming long-term cash flow projections, which in turn provide the basis for estimating long-term expected returns. This could be performed by analysts, with oversight by portfolio managers. The second function entails constructing portfolios with reference to the long-term expected excess returns. This task should fall to the portfolio manager exclusively. Analysts might be rewarded based on the accuracy of their cash flow forecasts across the asset universe of interest. The portfolio manager would be held accountable for the accuracy of the cash flow forecasts for the assets they include in the portfolio; and as well as the effectiveness by which they form portfolios to meet long-
term objectives. The latter would include the extent to which they build portfolios which exceed return targets over the long term. This would be measured by the difference between the sum of expected returns and changes in expected cash flows and required returns, i.e. item (12) in Figure B1. Evaluation of portfolio managers would probably also involve a subjective component, in part to work around the potential shortcomings of the approach as discussed further below.

Our approach is designed to place the projection of long-term cash flows and expected returns at the centre of performance evaluation, and potentially portfolio construction. Analysts are rewarded for the accuracy of their long-term projections. Portfolio managers are rewarded for identifying investments that offer attractive long-term expected returns based on plausible if not conservative cash flow forecasts. Portfolio managers should be interested in ensuring that cash flow forecasts are attainable, because they are penalized for buying assets that may appear to offer excess returns but where long-term cash flow expectations are subsequently revised downwards. That is, a ‘margin for error’ should be valued and appreciated. In sum, the attribution approach encourages a favour for assets that offer attractive long-term expected returns, which are in turn based on conservative forecasts.

Two implementation issues are worth acknowledging:

- **Setting required returns** – Required returns would be set in accordance with considerations such as objectives; the associated risk attached to each asset given those objectives; and perhaps the opportunity set of asset returns available in the market at the time. Required returns might be determined by reference to an asset pricing model. The process for establishing required returns would not be left up to the portfolio manager, given that they would have an incentive to reduce the hurdle. It could be subject to agreement with other stakeholders such as the governing board or investment committee, the CEO or the CIO. For individual asset classes, a minimum expected return hurdle might be specified for portfolio managers, be they either internal or external. Failure to identify assets that reach the minimum return hurdle would indicate to the portfolio manager that they should either be investing in cash, or returning the funds.

- **Time dimension** - The interval over which evaluation is performed might align with the cycle of cash flow forecast revision and portfolio review, possibly quarterly. However, longer review intervals such as a year should be feasible. One complication with longer intervals is that accounting for the effect of transactions and cash flows becomes more difficult. In any event, emphasis should be placed on the attribution over an extended period by aggregating across time.

Any attribution system will have issues: none are perfect. A problem with this system is that it presumes a buy-and-hold mentality, with limited anticipation of the dynamic investment opportunities that may arise from changes in expected returns. (Dynamic strategies were discussed in both Paper 1 and Paper 2.) Nevertheless, it does accommodate a reactive dynamic element to the extent that it allows for asset realizations and redirection of the funds to other opportunities as long-term expected returns are revised. Cochrane (2014) intimates that the payoffs from dynamic strategies might be considered as ‘dividends’, suggesting that they may be analyzed as a separate activity that generates a stream of cash flows. This represents a potential future extension on the approach as it is presented here.

Another problem is the reliance on cash flow forecasts as the basis for the estimation of expected returns and the subsequent attribution. Portfolio managers are likely to have considerable influence over cash flow forecasts, and may even be responsible for their formation. This may leave the decision process exposed to behavioural effects, such as optimism or confirmation biases, or provide opportunities and incentives to game the system. For instance, there could be a tendency to escalate cash flow projections to justify investments in the first instance. More importantly, after an investment is made, there would be an incentive to avoid reducing cash flow forecasts as this would subtract from the long-term return base. Independent checks on the plausibility of the cash flow forecasts would be necessary. For this reason, it would be advisable to reserve judgment until sufficient time has elapsed to evaluate the validity of the cash flow forecasts. For example, in the case of a greenfields infrastructure
investment, cash flow projections might not be evaluated until after the project is completed and has been in operation for sufficient time to form an informed opinion about the cash flow generating capacity of the asset.

Nevertheless, arguably the most important consideration when designing a performance evaluation system is the behaviours that are encouraged *ex ante*. While the approach outlined here may be far from perfect, it should provide a much stronger incentive to pursue long-term investing than more traditional systems where outcomes are heavily influenced by short-term price fluctuations.
Appendix C: The Future Fund Investment Process

The Board of Guardians of the Future Fund has developed a set of investment beliefs to frame the approach to its mission, governance, and investment strategy. These beliefs are reviewed periodically, and along with its Mandate interpretation, are the foundation inputs to the investment process. Figure C1 is a diagram of this process.

Figure C1: The Future Fund Investment Process

Macroeconomic analysis is at the core of the investment process at the Future Fund. A set of forecasts for real GDP, inflation, cash rates and bond yields is developed for nine economic regions in a ‘Central Case’. These forecasts are then used to generate assumptions around the key long-term drivers of asset pricing – current cash flows, cash flow growth and discount rates. The latter includes real interest rates, inflation and risk premia.

To aid the forecasting process, the Future Fund has identified a non-exhaustive list of seven strategic investment themes – Debt and Deleveraging, Policy and Politics, Globalisation and Emerging Wealth, Resource Scarcity, Inflation, Demography and Technological Innovation. In considering the impact of these secular themes, the Future Fund employs a long-term structural approach to examine issues that impact on cash flows, growth rates and risk premia from a global economic perspective; as well as conditions that may be conducive to changing trends between countries and industries.
The strategic investment themes also deepen that analysis by helping to identify:

- System stresses that may disrupt existing paradigms and risks to assumptions on cash flows and growth rates; and
- Path dependencies, and limits to the evolution of an existing paradigm.

The Future Fund views the policy management of the deleveraging process in various parts of the developed world as the key driver of global economic outcomes at present. More than five years after the financial crisis, certain major developed economies are unable to achieve growth rates much above potential despite large output gaps, significant budget deficits and unprecedented levels of monetary stimulus. This is a strong signal that deeper structural forces are restraining growth.

Longer-term, demographic trends lead the Future Fund to have a very high conviction view that average growth rates over the next decade will be materially lower in developed economies in comparison to history. This is also likely to imply significantly lower ‘neutral’ cash rates and bond yields in the future.

The Future Fund also undertakes scenario analysis by shocking the key drivers of asset prices. A policy and economic backdrop is considered that would generate a plausible range of economic outcomes over the medium to long-term, the composition and probability distribution of which will vary over time. The logic of the scenario narratives provides a frame for the conditional future behaviour of core macroeconomic factors – growth, inflation, real interest rates and broad risk premia – in comparison to what is presently discounted by markets.

As part of the integrated investment process at the Future Fund, the investment team engages in a regular dialogue to reconcile the top-down outlook on the macro-economy and markets with opportunities and risks identified from the bottom-up. In particular, this involves integrating the bottom-up risk-adjusted analysis of opportunities driven by the capital market research and the domain expertise of the investment sector teams; with the top-down risk-adjusted valuation analysis that is informed by the economic and capital market research of the investment strategy and risk team.

Given the breadth and diversity of the Future Fund’s portfolio, the synthesis of these views and the associated relative valuation analysis is not always simple or straightforward. However, it is the most crucial component of the portfolio design process that ultimately identifies the most accretive ‘access points’ for desirable risk exposures and investment themes.

The Board of Guardians believes that the single measure that embodies the goal of the Future Fund relates to achieving the mandated returns over rolling 10 year periods. In this context, the primary risk faced by the Future Fund is failing to meet this objective. While the Board believes that the amount of risk taken in the portfolio cannot be captured in one figure, it is best assessed by reference to downside outcomes over rolling 3 and 10 year periods.

More generally, the Future Fund believes that risk has many dimensions, all of which may vary through time in different ways. As a result, risk is too complex to be defined by a single number. Certain risks, like reputational or geopolitical risk for example, are not that easy to quantify at all. The Board of Guardians therefore believes that the assessment and management of risk should emphasize qualitative considerations, through a deep understanding of the investment environment and its potential impact on the portfolio. However, quantitative measurement is considered an important tool to both support and test this process. The Future Fund has developed a set of portfolio ‘lenses’ to better capture the broad range of risks to which the portfolio is exposed. Figure C2 provides a summary of this analysis as at 30 April 2014.
The Future Fund has also developed a set of investment policies to help effectively implement its investment process by clearly defining what it considers an acceptable portfolio risk profile. As the Future Fund has matured, and its range of underlying investments has become more diverse, the demands on portfolio risk management have necessarily increased. The scope of its policies has broadened in response.

The investment risk management framework of the Future Fund is supported by the four primary investment policies described below:

(i) A Portfolio Risk Exposure Policy sets an acceptable range for the broad market risk of the Future Fund. This is measured both by the expected sensitivity of the Future Fund’s performance to equities – the dominant source of market risk – and the expected capital loss in adverse investment conditions over medium to long term.

(ii) A Short-term Liquidity Risk Policy is designed to ensure that the Future Fund holds enough cash (and/or other highly liquid securities) to meet its short-term cash flow obligations at all times. If the level of liquidity in the Future Fund is insufficient to pass a daily stress test, it must be replenished.

(iii) A Portfolio Illiquidity Policy sets an acceptable upper threshold for the level of illiquid investment. The Future Fund has a greater tolerance for illiquidity than most other investors, and expects to be rewarded for well-chosen illiquid investments. However, very high levels of portfolio illiquidity may limit the flexibility of the

![Figure C2: Portfolio ‘Lenses’ Analysis](source: the Future Fund)
Future Fund to make new investments. Its appetite for illiquidity is also likely to gradually decrease as it approaches its drawdown phase beyond 2020.

(iv) **A Currency Exposure Policy** sets an acceptable range for the currency exposure of the Future Fund. Along with equities, currency is one of the major drivers of portfolio risk, and is an important consideration in liquidity risk management.

These four ‘pillars’ of the Future Fund’s investment policy platform are highly interdependent, and their interaction can often be quite complex and challenging to manage. However, the Future Fund believes it has developed a sufficiently holistic and flexible framework to effectively manage the risk of the portfolio.
References for Paper 3


Bodie, Zvi, Alex Kane and Alan Marcus (2014), Investments, McGraw-Hill/Irwin, 10th Edition


CFA (2006) “Breaking the Short-Term Cycle”, CFA Institute and Institute for Corporate Ethics

CFA (2013) “Long-Term Financing: Investor Perspectives in Europe”, CFA Institute, September


Hewitt (2004), “Investing Pension Funds As If the Long Term Really Mattered: Ideas from the Universities Superannuation Scheme and Hewitt Bacon & Woodrow Competition”, Hewitt Bacon & Woodrow, January


Laverty, Kevin J. (2004), “Managerial Myopia or Systemic Short-Termism? The Importance of Managerial Systems in Valuing the Long Term”, Management Decision, 42(8), 949-962


Marathon (2007), “Guidance Note For Long-Term Investing”, Marathon Club, Spring


