Netspar

Network for Studies on Pensions, Aging and Retirement

Netspar DISCUSSION PAPERS

Andrew Ang and Knut Kjaer

Investing for the Long Run

DP 11/2011-104 (revised version January 2012)

Investing for the Long Run

Andrew Ang and Knut N. Kjaer

5 January 2012

Long-horizon investors have an edge. They can ride out short-term fluctuations in risk premiums, profit from periods of elevated risk aversions and short-term mispricing, and they can pursue illiquid investment opportunities. The turmoil we have seen in the capital markets over the last decade has increased the competitive advantage of a long investment horizon. Unfortunately, the two biggest mistakes of long-horizon investors—procyclical investments and misalignments between asset owners and managers—negate the long-horizon advantage. Long-horizon investors should harvest many sources of factor risk premiums, be actively contrarian, and align all stakeholders so that long-horizon strategies can be successfully implemented. Illiquid assets can, but do not necessarily, play a role for long-horizon investors, but investors should demand high premiums to compensate for bearing illiquidity risk and agency issues.

1. Introduction

We define a long-horizon investor as an investor having no specific short-term liabilities or liquidity demands, or that these short-term commitments or liquidity needs are small in proportion to the total portfolio of the investor. Long-horizon investors, therefore, have "captured" capital that will be drawn down only in the distant future. The long horizon confers a number of advantages over short-term investors, including

- The ability to ride out short-term fluctuations in returns.

  Asset returns are noisy in the short term. Furthermore, short-term volatility temporarily exacerbates liquidity needs, margin calls and funding issues, makes (operational) risk management more difficult, and frays the working relationships between managers, board members or trustees, the ultimate asset owners, and other stakeholders. Long-run investors have the luxury of knowing that there are no short-term funding issues or liabilities, and can earn risk premiums that often manifest reliably only over long periods.

- Being able to profit from periods of elevated risk aversion or short-term mispricing.

  In rational asset pricing models, prices are low because risk aversion is high and investors bid down prices in order to receive high future expected returns. If a long-

horizon investor's risk aversion remains constant, he can take advantage of these periods with low prices. In behavioral models, prices can be low because of temporary periods of mispricing. Again, a long-horizon investor can take advantage of these times knowing that prices will return to fair values over the long run.

- Taking advantage of illiquid investment opportunities.

  Clearly short-horizon investors cannot invest in illiquid investments if they wish to access capital before the illiquid investment can be realized. So, a long-horizon investor can take advantage of illiquid investment opportunities.

Sadly, long-horizon investors too often squander their advantages. In Section 2, we describe the two biggest investment mistakes made by investors that cause them to forfeit their long-horizon advantage: procyclical investing and misalignments between asset owners and delegated managers. In Section 3, we lay out a framework showing how investors can take advantage of their long horizons. Section 4 concludes.

2. Missed Opportunities

We begin by illustrating the missed opportunities induced by procyclical investments and not adequately addressing agency issues between asset owners and managers. To do this, we use the example of a very large asset manager, the California Public Employees' Retirement System (CalPERS), which held $240 billion in assets at June 30, 2011. There are, of course, many areas where CalPERS is a leader, especially in activist social and ethical investing, but its record over the past decade serves as a cautionary tale in not taking full advantage of its long horizon.

2.1 *Procyclical Investments*

During the turmoil in 2008-2009, CalPERS, lost $70 billion.[1] Many investors also lost money. The difference with CalPERS is that a lot of this money did not come back due to procyclical investment behavior: CalPERS sold equities when equity prices were low (and expected future returns were high). In 2008, a variety of circumstances led CalPERS to sell equities exactly at the wrong time. Stock lending blew up and as clients redeemed loans, CalPERS sold equities to raise cash. CalPERS had severe liquidity problems and sold equities to meet

[1] Robinson, E., and M. Marois, Cleaning Up CalPERS, Bloomberg, Sep 9, 2010.

obligations from private equity and real estate deals.[2] The Board became skittish.[3] Before the financial crisis, CalPERS' equity weight was 60% at June 30, 2007, as shown in Figure 1. At June 30, 2008 the equity weight shrank to 52% as stock markets started to decline. CalPERS deliberately sold equities bringing the equity weight down to 44% at June 30, 2009 and missing the rebound in public market returns in early 2009.[4] In 2008, CalPERS sold 2.3 million shares of Apple for approximately $370 million, a stake that would be worth $920 million in October 2011.[5]

The shortcomings of CalPERS procyclical real estate investments were also made apparent in the financial crisis. Figure 1 shows that from a 5% low in June 30, 2005, CalPERS aggressively ramped up its real estate allocation reaching 9.2% in June 30, 2008—right when real estate was crashing. As real estate surged during the 2000s, CalPERS' internal controls on real estate investment withered and outside investment advisors held large sway and discretionary power to allocate billions in capital to real estate deals. They used it. In January 2007 CalPERS invested $970 million in LandSource, which held residential land in LA County. It was bankrupt the next year as real estate crashed. In Stuyvesant Town-Cooper Village in New York, CalPERS lost $500 million after lenders took control of the property. CalPERS used leverage extensively, up to 80% in some cases, in its real estate deals, in ways that were used by its real estate partners that were highly opaque to CalPERS' managers. Their use of leverage peaked just as the real estate market peaked. At June 30, 2008, one of CalPERS real estate investments had a value of negative $305 million due to leverage.[6]

Countercyclical investing buys low, rather than CalPERS buying real estate at its peak, and sells high, rather than CalPERS selling equity at its low, and long-horizon investors should be countercyclical.

2.2 Misalignment between Asset Owners and Managers

The principal-agent problem has been long studied in economics. It is a serious issue that impedes taking advantage of a long investment horizon and can lead to procyclical investments, the inability to generate value, and poor risk controls.

---

[2] Karmin, C., and Lublin, J. S., Calpers Sells Stock Amid Rout to Raise Cash for Obligations, Wall Street Journal, Oct 25, 2008.

[3] Prior to February 2009, CalPERS had no formal rebalancing process. See Burr, B. B., CalPERS Creates Formal Rebalancing Process, Pension and Investments, Feb 12, 2009.

[4] Part of this decline was due to the shift into private equities, funded by reduction in public equities, during this period (see Wayne, L., California Pension Fund Hopes Riskier Bets Will Restore Its Health, New York Times, Jul 23, 2009), but public equities rebounded much more during this period than private equities. This action of selling public equities at low prices, and buying private equities, is still procyclical investing.

[5] Robinson and Marois, Cleaning Up CalPERS.

[6] Corkery, M., C. Karmin, R. L. Rundle, and J. S. Lublin, Risky, Ill-Timed Land Deals Hit CalPERS, Wall Street Journal, 17 Dec, 2008.

To capitalize on the long horizon, there has to be consistency and buy-in from both the principal (the asset owner or the stakeholders of the fund) and the agent (the fund manager). There are many principal-agent problems in large organizations, including internal and external managers, the board versus the international management company, and the ultimate beneficiaries of the fund versus the board or the fund manager. Successful long-horizon counter-cyclical investing can be done only when the principal and agent, in each principal-agent relationship, can tolerate short-term losses. These losses are transitory and the product of investment strategies that earn risk premiums that can only be verified over long horizons.

CalPERS' investment performance was hindered, especially in 2008, by agency issues. CalPERS was affected by pay-to-play scandals involving placement agents who received money to help managers win investment mandates from the fund.[7] Several agents involved in the scandals have been jailed. These are certainly examples of conflicts of interest, but they were not the biggest agency problems faced by CalPERS.

In real estate, CalPERS favored joint venture agreements where it had little ability to monitor and control risk. It largely left management of real estate to its outside partners, even though CalPERS bore almost all the risk. These arrangements made it hard to measure the quality of the agent, set effective risk boundaries, and created the worst possible alignments between CalPERS and its real estate investment advisors. CalPERS also had no systems to measure the cost effectiveness of its external managers until recently. Too much complexity and high costs in the total portfolio obscured the underlying risk exposure. As Robinson and Maoris write, "Board members kicked themselves for losing grasp of the scale, and leverage, of their wagers during the bubble."[8]

Alignments between asset owners and managers are essential to being able to focus on the long term, when risk premiums will be ultimately earned, and being able to ride out periods of temporary losses and volatility. Indeed, a risk premium is earned over the long run to compensate investors for periods of short-term risk and losses.

Pro-cyclical investing, made worse by misalignments between the many stakeholders, caused CalPERS to return -23% in its fiscal year ended June 30, 2009 compared to the average large public pension fund return of -19% during this same period.[9] It is no wonder that given this experience, Joseph Dear, the new CIO has some house-cleaning to do and said, "I cannot overstate our determination to make this a new day here."[10]

---

[7] See http://www.calpers.ca.gov/eip-docs/about/board-cal-agenda/agendas/full/201103/srrr.pdf
[8] Robinson and Maoris, Cleaning Up CalPERS.
[9] Economist, Investor, Heal Thyself, Sep 2010.
[10] Economist, Investor, Heal Thyself.

3. Exploiting the Long Horizon

We recommend four basic steps for exploiting the long-horizon edge: (1) Institutionalize contrarian behavior, (2) Build a robust factor portfolio to harvest many sources of factor risk premiums, (3) Create close alignment between asset owners and managers, and (4) Demand sufficient risk premiums for illiquid investments.

3.1 Institutionalize Contrarian Behavior

Investing counter-cyclically is hard. It involves selling assets that have done well—when these assets are all the rage—and buying assets that have declined in price, sometimes precipitously, when the majority is shying away from them. Investing counter-cyclically goes against human behavioral tendencies. It is much easier just to follow the crowd than to stand up as one of few contrarians and load up with risky assets at times when everyone else is doing exactly the opposite.

The best way of investing counter-cyclically is to institutionalize contrarian investment behavior. A strict rebalancing rule is a robust way of doing this. Rebalancing can be carried out in many different ways, and with many different schemes, but common to all of them is it forces investors to sell assets that have risen in value and to buy assets that have fallen in value, and doing so brings those assets back in line with fixed portfolio weights. Rebalancing is counter-cyclical.[11]

Many investors, however, with rebalancing rules failed to rebalance during the financial crisis. Some investors thought "this time is different" and simply put the rules aside. For other it was the lack of liquidity and/or risk capacity that caused the rebalancing rules to be breached. The paradox is that it is precisely during such challenging times you most need the rules. The need for decision rules is a function of a fund's governance structure. For some investors, especially those with many stakeholders that influence key investment decisions, a rules-based procedure that cannot be arbitrarily changed during times of stress is essential.

One example of successful application of rebalancing rules is the Norwegian Government Pension Fund Global (the Norwegian sovereign wealth fund). The rules are set by the Parliament who is the owner of the risk on behalf of the current and future Norwegian population. Norway was the largest buyer of equities globally during 2008-2009 and it is the discipline imposed by the rebalancing rule that allowed the fund to increase its equity holdings as many others were selling.

The performance of Japanese equities since the 1990s is an example where rebalancing between Japanese bonds and Japanese equity would have been produced losses. It is true

[11] Bill Sharpe labels "going with the flow" and holding market-capitalization weights as an "adaptive asset allocation policy." See Sharpe, W. F., 2010, Adaptive Asset Allocation Policies, Financial Analysts Journal, 66, May/June, 45-59.

that an investor would have been better off holding purely Japanese bonds during this time. However, investors with a rebalancing regime in place before the Japanese bubble started would have been sellers during the 1980s when prices were elevated and endured fewer losses. Japan is also only one part of a global portfolio and an important part of rebalancing is to rebalance over many different sources of risk premiums (see below).

There may be scope for improving rebalancing rules by including valuation dependent metrics. This would help investors to weight asset classes or risk premiums more than predicted by a simple rebalancing rule. A rebalancing rule with fixed weights certainly buys when an asset has declined in price, relative to other assets in the portfolio. A more aggressive rebalancing rule would buy even more if that asset's expected return is high, relative to the risk premiums of other assets. To do this requires embedding a notion of valuation of that asset class in the rebalancing rule. These valuation-based rebalancing rules must be constructed robustly. These rules need to redefine risk—which is often defined as volatility other short-term measurements. Times with low volatility are called "low risk" and often coincide with high prices, like the mid-2000s, but these are actually periods of high risk because future expected returns are low. Using valuation rules would incorporate one measure of risk as the price paid against the long-term fair value of risk premiums.

On the other hand, valuation metrics are regime dependent. In rare cases, valuation methods are no longer valid because a regime shift occurs. "This time is different" periods are extremely rare.[12] We recommend that a formal rebalancing process should include safety valves for dealing with "catastrophe scenarios" which may include highly infrequent shifts in regimes. The key element is to have procedures that ensure discipline in the decision-making process so that potential regime shifts can be discussed in the funds' written investment beliefs. The risk of acting pro-cyclically should be well understood by stakeholders and decision makers. Any decision on taking risk off the table must be made together with formal rules for when risk should be taken on again. Taking off risk is always easy. It is the ability to put on risk in troubled times that makes the difference between professional and mediocre investors. Funds that lack clarity in the governance structure and have weak alignments between asset owners and managers should have a high threshold for adding this type of safety valve into their rebalancing rules.

3.2 Build a Robust Factor Portfolio

[12] Two examples of "this time is really different" are pre-1933 where the average spread between three-month commercial paper yields and 10-year Treasury yields was negative and post-1933 where the average spread has been positive and pre-1987 where there was no downside skewness in the smile curve across strikes of implied option volatilities and post-1987 where there has been negative skewness in implied volatilities.

Factor risk exposure drives the bulk of expected risk and return for large, long-horizon investors. Unfortunately this is generally not the way many funds organize their investments and how boards and top management prioritize their time. Too often, investors focus on selecting managers with "alpha" even when they contribute only marginally to total fund performance. The financial crises over 2008-2009 also exposed limitations in the current paradigm of using alternative asset management vehicles to improve on portfolio diversification. Their betas during these stressful times were higher than those of the normal liquid asset classes. Using alternatives for diversification is costly and also contributes to complexity which makes it difficult to understand the true, underlying risk characteristics of the total portfolio.

A better model of diversification is to diversify across factors. Factors go beyond asset classes. Academics have known the importance of multiple factors in determining asset returns since the 1970s.[13] Ang (2010) uses an analogy of nutrients and food to illustrate the relationship between factors and returns.[14] Individuals eat food to sustain life, but it is not the food per se that provides sustenance; it is the underlying nutrients contained in food (water, carbohydrates, protein, fiber, and fat) which are essential. Factors are to assets what nutrients are to food. Factor theory is based on the principle that factors are the driving force behind asset risk premiums. Assets are bundles of different types of factors just as foods contain different combinations of nutrients.

There are different types of factors. Examples of fundamental factors are inflation, economic growth, and political risk. Certain asset classes are factors themselves, like G10 sovereign bonds and developed market equities. Other asset classes, however, are certainly not factors like private equity and hedge funds, and instead bundle up different types of factor risk premiums in sometimes expensive, leveraged, and non-transparent investment vehicles. There are also investment, or style factors, like value-growth and momentum which transcend asset classes. Value-growth, for example, is the name given to buying assets with high yields (or low prices) and selling assets with low yields (or high prices). In foreign exchange, this strategy is called "carry" while in equities it is "value investing". In fixed income, it is called "riding the yield curve" and in commodities it is called "the roll" and related to normalization or backwardization. Figure 2 shows pictorially how factors drive asset returns, which ultimately make up a portfolio's total return.

The risk factor approach is a smarter way to diversify a portfolio rather than relying on asset classes. Just as a balanced diet consists of foods providing the optimal underlying blend of nutrients, an investor should hold a combination of assets—but these assets serve to provide the optimal exposure of factor risk. Looking at asset classes can easily "double count" factors and lead to investors over-estimating the true amount of diversification they are achieving, which the financial crisis made clear. For example, credit risk is in corporate

[13] Ross, S. A., 1976, The Arbitrage Theory of Capital Asset Pricing, Journal of Economic Theory, 13, 341-360.
[14] Ang, A., 2010, The Four Benchmarks of Sovereign Wealth Funds, working paper, Columbia University.

bonds, credit derivatives, but also in equities and real estate. Basing investing on factors can result in more robust portfolios as investors gain a better and more intuitive understanding of the key performance drivers of portfolios. Moreover, factor indices are the best way to benchmark active portfolio managers: if momentum or volatility risk can be done cheaply, then why should we pay 2-20 for a hedge fund manager to do it?

There are certainly many challenges in building optimal factor, rather than asset-class based, portfolios. Some of the factors involve dynamic portfolio strategies that have long been the purview of (often very expensive) active management, like value-growth investing, volatility, and momentum. Some other factors have mappings to asset returns that only manifest themselves during certain periods. Some leading global institutional investors, like Canada Pension Plan Investment Board, the Danish pension fund ATP, the Norwegian sovereign wealth fund, and the sovereign wealth funds of New Zealand and Alaska, among others, are pursuing research in this area and gradually moving towards the risk factor based approach. Their ambition is to harvest risk premiums in a more efficient way than just combining asset class based index management and traditional alternative investment vehicles.

3.3 Create Close Alignment between Asset Owners and Managers

Lack of alignment between the asset owner (the principal) and the manager (the agent) creates room for agents to serve their own interests and not those of the principal. This problem of agency is well studied in economics. In the context of delegated asset management, misalignments between asset owners and managers often result in squandering the benefits of the owner's long horizon advantage.

There are several agency problems which lead to the asset owner not being able to capitalize on the advantages of a long-term horizon. First, agents often have shorter horizons than their clients as they focus on short-term performance through the fees they generate. Investors often chase returns, so agents have incentives to maximize short-term returns to generate flows. Managers normally know much more about the risk characteristics of their portfolios than asset owners. That asymmetric information generates opportunities to "fake skills" where managers can hide risk so they are paid more than their true value-added relative to the correct risk benchmark. While performance in the long run is a series of short-run returns, the strategies taken by managers to maximize short-run returns often take concentrated risk that is not readily observable ex ante, or take risk that has only a small probability of being realized over short periods, and would not be optimal for a long-run horizon.

Contract design can mitigate agency problems to some extent by defining the investment universe precisely and setting explicit time horizons for performance measurement.

Perhaps a more effective way to counter the informational and skill advantages of managers, however, is to upgrade the asset owner's own investment competence, increasing the ability of asset owners to assess, monitor, and evaluate their agents. From Section 3.2, a thorough understanding by the asset owner of the key factor drivers of risk and return, and knowing how to efficiently tap into these factor drivers, is the best way to counter the traditional disadvantages of asset owners relative to managers.

Such understanding should be spelled out explicitly in the asset owner's investment beliefs, where the asset owner is represented by a Board of Trustees, Ministry of Finance, Parliament, or similar governing entity.[15] The investment beliefs should include the basic reason for taking risk, the perceived link between risk taking, and the purpose and objectives of the fund. The board should have a clear stance on why and how risk taking is compensated and the expected reward to risk ratio that such risk taking should produce. Through time, this should be tested by evaluating realized returns against ex-ante expectations. Finally, the board should write down its view on own ability to select and monitor agents and how it can handle potential agency issues.

This procedure will ensure that the board, as representative for the ultimate owner of the fund, will own the bulk of the risk taking of the fund. Crucial to this process is an understanding why losses can occur and forming appropriate responses. Using factors certainly helps in this regard by looking through assets to the fundamental risks of the portfolio. When the fund is hit by general market turmoil, and this drawdown is the result of the board seeking to take factor risk premiums that will be rewarded in the long run, then the board cannot just blame the agents and terminate the contracts. This allows the agent to avoid time-inconsistent actions, especially in not panicking and taking risk off the table at times when performance has been bad—which are typically times of low prices and future high expected returns. The starting point for the delegation to the manager should be well-specified factor benchmarks. Combined with a robust rebalancing rule for the factor exposures, this lowers the risk of procyclical investment behavior.

The board can build competence in several ways. They can select board members who are investment professionals, start a board educational program, or set up a team of experts close to them as advisors or investment committees. Recruiting investment professionals is not an obvious recipe for success. They may shift the board away from the fund's base constituency and weaken legitimacy and the ability to communicate effectively with the fund's ultimate asset owners. Investment professionals who are especially close with

[15] We assume in our discussion that the board fully reflects the interest of the constituencies. That is often not the case and there is an additional agency problem between the board and the constituencies. One example of such an agency issue is with U.S. public pension funds, where boards have taken far more risk, tolerated lower contributions, and given more generous promises than what the residual owners of the funds – taxpayers – would have permitted if they were directly included in the decision making process. The potential agency conflicts between constituencies and their representatives can be reduced by high transparency.

financial intermediaries may in fact generate more agency problems, and higher costs, in steering business towards those intermediaries.

Some funds solve the competence issue by hiring consultants. That adds another agency dimension. Consultants are paid by service fees and not by long-term results. Often, advice given by consultants simply adds complexity to the fund and masks the true fundamental factor drivers. The best consultants do enable the asset owner to understand the underlying factor risks the fund is taking. Two more common reasons to hire consultants seem to be their function as "scapegoat" when results are bad and for signaling the board is doing its "fiduciary duty".

3.4 Demand Sufficient Risk Premiums for Illiquid Investments

Illiquid assets can only be realized by investors with a much longer horizon than the expected payoffs of the illiquid assets. These are illiquid investments that short horizon investors cannot do, so long-horizon investors have an edge. But having a long horizon does not mean that the long-horizon investor should automatically invest in illiquid assets. Investing in illiquid assets means relinquishing liquidity and thus the inability to rebalance or trade when desired. This is costly and the long-horizon investor should demand an appropriate illiquidity premium to invest in illiquid assets. That is, investment in illiquid assets should not be made at any cost. The appropriate illiquidity premium is investor-specific because the cost to an investor for bearing illiquidity risk depends on the need for liquidity through liabilities, the ability to tap factor risk premiums, the governance structure and skills that can support active management in illiquid investments, and the considerable agency issues involved in the management of illiquid assets. Computing an investor-specific illiquidity risk premium entails an asset allocation model where an investor can measure the opportunity cost of holding illiquid assets.

Unfortunately, there are few asset allocation models that directly account for illiquidity risk. In fact, the ubiquitous standard mean-variance optimization used in industry completely ignores it. Ang, Papanikolaou and Westerfield (2011) explicitly consider the effect of illiquidity on asset allocation.[16] In their model of illiquidity, illiquid assets can only be rebalanced when a Poisson arrival occurs signaling a liquidity event. When there is no liquidity event, illiquid assets cannot be rebalanced. As the average period between liquidity events is made very small, the model nests the traditional asset allocation models where rebalancing is always possible. For illiquid assets like real estate or private equity, the average time between rebalancing events may be once every ten years.

[16] Ang, A., D. Papanikolaou, and M. M. Westerfield, 2011, Portfolio Choice with Illiquid Assets, working paper, Columbia University.

There are three important findings in Ang, Papanikolaou and Westerfield (2011). First, illiquidity causes the investor to behave in a more risk-averse manner with respect to both liquid and illiquid asset investments and this effective risk aversion is time varying. The intuition is simple. An investor cannot "eat" or consume out of illiquid assets, only from liquid wealth. If you are wealthy, but hold everything in illiquid assets, you cannot eat. Thus, the investor cares about the ratio of illiquid to liquid wealth. That is, the investor's asset allocation and consumption depends on a solvency ratio. Harvard University found this out in 2008 where it had tremendous need for cash, but its endowment held large amounts of illiquid assets which could not be immediately liquidated to fund expenses.[17]

Second, illiquidity risk makes illiquid assets much less compelling. As a baseline case, consider the full liquidity case where the optimal allocation to the illiquid asset is 59%, close to a typical 60% equity holding for many institutions. Now, suppose the risky asset can only be traded, on average, once per year. The optimal holding of the illiquid asset when the investor can rebalance is now 44%. When the illiquid asset can be rebalanced only once in 10 years, on average, the optimal proportion is only 5%. Clearly, optimal holdings of very illiquid assets should generally be very modest.

Third, investors should demand steep premiums to bear illiquidity risk. What increase in the expected return of the illiquid asset is required for the investor to have the same utility when all the assets are liquid? This is the compensation for bearing illiquidity risk. The illiquidity premiums are shown in Table 2. A single private equity fund that can be rebalanced once every 10 years, on average, should have a premium (or hurdle rate) of 6%. Illiquid assets that an investor can rebalance every two years require a 2% premium.

There is another reason why investors should demand a premium for investing in illiquid assets. Investing in illiquid assets involves considerable agency problems. The typical contracts are opaque, it is hard to monitor the fund managers, and market values are not observed. Typical contracts involving investment in illiquid assets exacerbate, rather than solve, agency issues.

4. Conclusion

Long-horizon investors have an edge. They have the ability to reap risk premiums that are noisy in the short run and only manifest over the long run. They can acquire distressed assets when investors with over-stretched risk capacity have to sell. They can also pursue opportunities to invest in illiquid assets.

There are two pitfalls that hinder long-horizon investors in fully exploiting their advantage: procyclical investing and misalignment between asset owners and managers. These are

[17] See the case "Liquidating Harvard" from Columbia Business School CaseWorks.

intertwined. Counter-cyclical investing requires strong governance structures to withstand the temptations of selling in blind panics when asset prices drop. Agency conflicts contribute to procyclical investment behavior.

To take advantage of the long-run advantage, investors should first institutionalize contrarian behavior by adopting a rebalancing rule. Avoiding procyclicality also requires redefining the concept of risk away from just volatility. Low volatility often coincides with low expected risk premiums, which are a more relevant concept of risk for the long-run investor who can withstand short-term fluctuations. Investors should practice factor investing and build robust factor portfolios. Long-term investors can harvest many sources of factor risk premiums. They should go beyond asset classes and use the underlying factor risk premium drivers as the basis for portfolio construction. Doing this requires creating close alignment between asset owners and managers. The decision to take factor risk should be a top-down decision and anchored throughout the organization. In fact, the two most important decisions in fund management should not be delegated to agents: the level of risk to be taken and the key sources of risk premiums to be exploited. Finally, long-term investors can pursue illiquid investments. But, acquiring illiquid assets comes at a cost in not being able to rebalance and not having “dry powder” to buy distressed assets during bad times. Investors should charge significant premiums for bearing illiquidity risk.

Table 1. Optimal Illiquid Asset Holdings

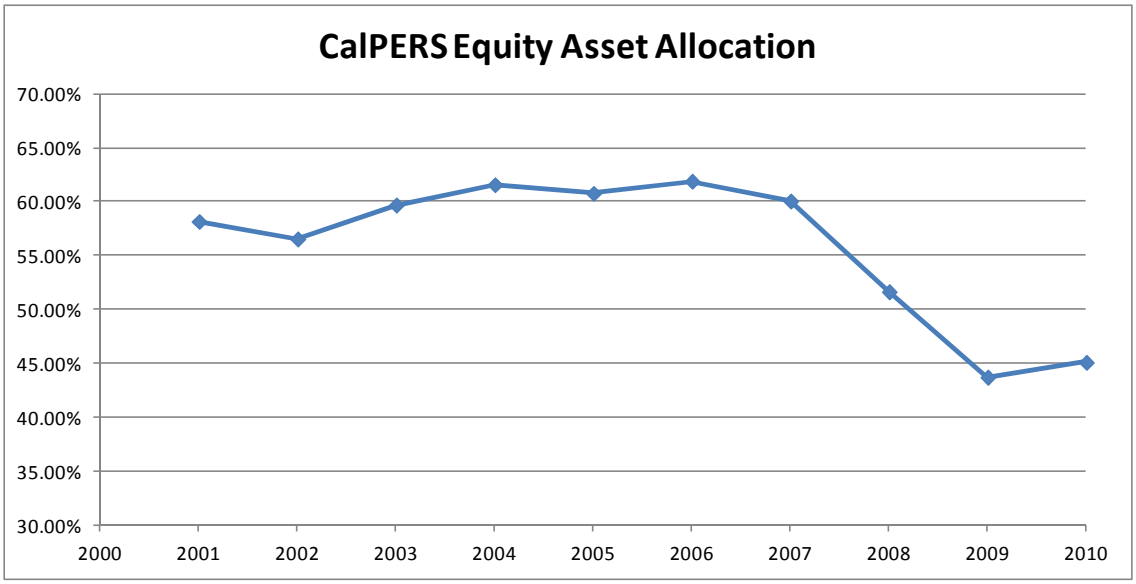
Average Time Between Rebalancings	Optimal Rebalance Value
10 years	0.05
5 years	0.11
2 years	0.24
1 year	0.37
½ year	0.44
Continuous Rebalancing	0.59

Source: Ang, Papanikolaou and Westerfield (2011). Optimal illiquid asset holdings for different average times between rebalancing. The row for "Continuous Rebalancing" corresponds to instantaneous rebalancing.

Table 2 Illiquidity Premiums

Average Turnover	Illiquidity Premium
10 years	0.060
5 years	0.043
2 years	0.020
1 year	0.009
½ year	0.007

Source: Ang, Papanikolaou and Westerfield (2011). The table reports the additional premium which the illiquid asset needs to bear in order for the investor to be indifferent between an asset allocation problem where the illiquid asset could be continuously rebalanced.



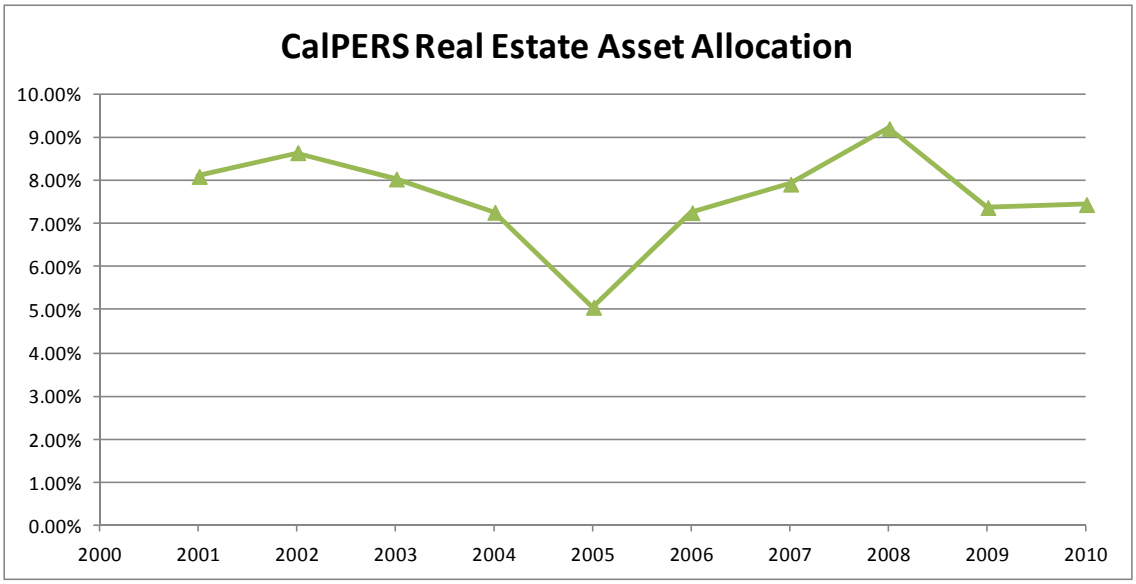


Figure 1: CalPERS Asset Allocation. We plot the asset allocation of CalPERS in equities (domestic and international) and real estate in terms of market value. The fiscal year ends June 30. Source: CalPERS comprehensive annual reports.

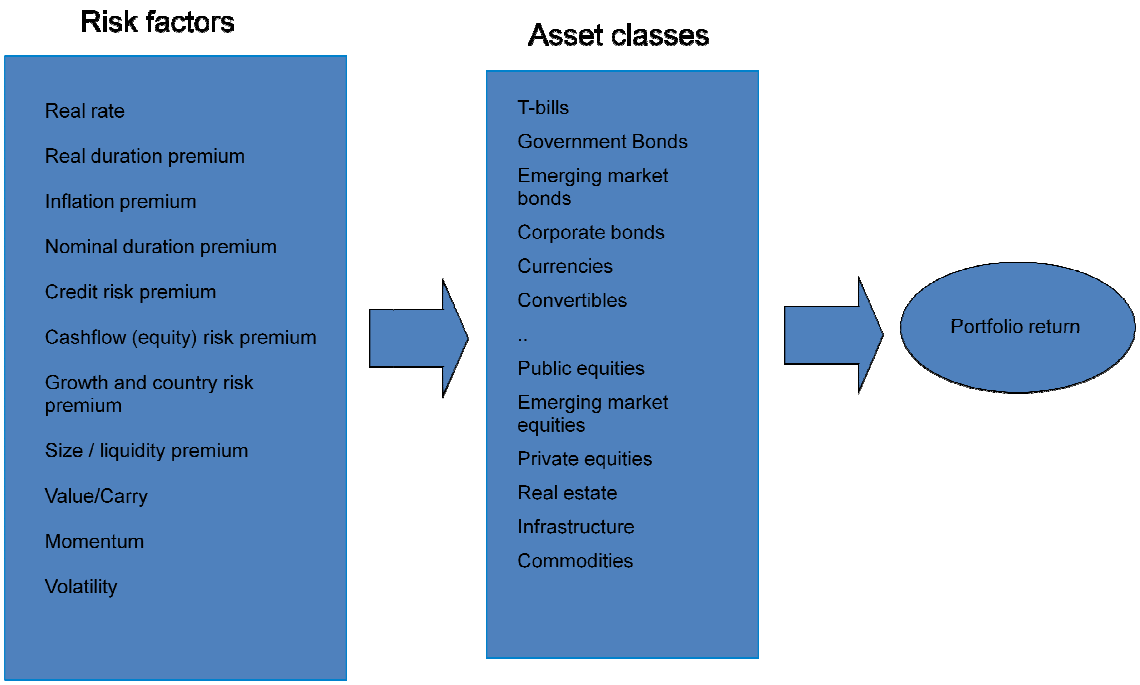


Figure 2: Factors and Assets. Different types of factor risk premiums are reflected in the returns of different asset classes.