Alternatives and Liquidity: *Will Spending and Capital Calls Eat Your "Modern" Portfolio?*

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In the "lost decade" that just ended—a decade during which broad-based equity indices provided a zero real return—investors have moved a mountain of money into the once-exotic category of investments called *alternatives*. Alternative investments today primarily consist of hedge funds and private equity, but also include real estate, energy, agriculture, timber, and infrastructure. What most of these alternatives have in common is illiquidity. The money is locked up for years, and early redemption is either prohibited or very expensive.

Most investors have not thought very much about the liquidity of their portfolios. They have simply assumed that, based on their experience with portfolios consisting mostly of liquid public securities, they could meet liquidity requirements either with cash already held in the portfolio or by selling stocks and bonds. But the increased use of alternatives, and other strategies impacting liquidity, should cause investors to question this assumption.

Alternatives performed well during the lost decade. But investing is about the future, so the only rational explanation for today's high allocations to alternatives is that investors believe an additional dollar allocated to alternatives provides a larger contribution to the portfolio's overall Sharpe ratio than a dollar allocated to non-alternatives.[1] This comes very close to saying that investors are expecting yet another lost decade for equities—perhaps they should think again. Our purpose here is not to ask whether alternative investments are a good idea from a return viewpoint, but rather to question whether a portfolio with a large alternatives allocation has enough liquidity to meet the cash needs of various types of funds—foundations, endowments, and pensions.

Most alternative investments do not typically pay cash income. (Real estate partnerships are an exception.) Nevertheless, the ultimate purpose of all investments is to generate cash—eventually—and alternatives are no different. Investors can receive cash from *evergreen* (nonmaturing) funds by redeeming shares, typically after a two- or three-year lockup period has elapsed since the initial investment. Other vehicles, such as private equity funds, have liquidation provisions; that is, the fund is set up for a limited term, after which public stocks and cash held by the fund are distributed to investors. In any of these types of funds, the illiquidity problem is not permanent.

But an illiquidity problem that is only temporary, lasting a few years, should be of grave concern to institutions, such as most private foundations, which have high payout requirements, but no new money coming in. Such investors, with their own intrinsic liquidity concerns, must be very careful about over-allocating to inherently illiquid assets. Other types of institutions, such as university endowments and defined benefit pension plans,

have more flexibility because they do have money coming in, but at very high alternatives allocations, they still need to be concerned about liquidity.

Why? When faced with a payout requirement—such as a grant budget for a foundation, a contribution to a university's operating budget for an endowment fund, or a pension benefit payment for a pension fund—the money must come from the institution's public equity, bond, and cash allocations. It is not practical to wait until the alternatives generate cash; the liquidity is needed *now*. If, by Murphy's Law, the call for liquidity comes when the public markets are down, then the institution must sell at the bottom of the market—not only turning paper losses into real losses, but turning itself into a forced seller when, by all rights, it should be buying. There is another choice available to some institutions—borrowing. We do not think it prudent, however, for most institutions to be so heavily allocated to alternatives that they have to borrow to meet current cash obligations. Look at the current (early 2008) state of the credit markets. Who would want to rely on them for one's survival?

What follows is a cautionary tale. We construct a greatly simplified model of a plan sponsor (foundation, endowment, or pension fund), and use simulation to study the problem of illiquidity caused by alternatives allocations. We run various portfolio allocations against market scenarios that we describe as *normal*, *bear market*, and *catastrophic market*. The results are surprising. Because of forward capital commitments, the alternatives allocation tends to rise even in normal markets. In a bear market or catastrophic market, a high initial allocation to alternatives results in the asset class just about completely taking over the fund.

CAPITAL CALLS

What are these troublesome forward commitments of capital?

A forward commitment exists when an investor in a fund is required to contribute additional capital in the future on a schedule that is typically determined by the fund manager in accordance with perceived opportunities in the markets. These additional capital contribution requirements (capital calls, also known as drawdowns) are binding and may be regarded as a form of debt or leverage.[2] Regardless of whether capital calls are counted as leverage, they are a key source of illiquidity in alternatives and this study focuses carefully on them.

An investor who does not meet a capital call may face an involuntary liquidation of his existing investment in the fund. To be sure, an investor who is faced with a capital call that he cannot meet may be able to sell his private equity position in the secondary market, typically at a deep discount, thus avoiding both an involuntary liquidation and a cash shortage. However, transaction costs in this situation are very high and difficult to measure, making this exit strategy an act of last resort.[3]

Hedge fund investments rarely involve capital calls, but private equity funds and other alternatives, such as real estate, energy, and infrastructure partnerships, quite often do. Because hedge funds have probably absorbed just about all of the assets they can absorb without compromising expected returns, we believe that many of the most interesting and profitable alternative investments will have a private equity-like character and will be subject to capital calls.[4]

We also believe that if there is a true, economic *illiquidity premium* in the market (i.e., a higher rate of return earned on projects that require tying up money for long periods of time), this premium is unlikely to accrue to hedge funds. This is because hedge funds are built mostly out of long and short positions in liquid securities, so the illiquidity of hedge funds is artificial. That is, it is imposed by the fund manager to prevent excessive trading and to discourage runs on the fund. To put the idea another way, the illiquidity of hedge funds is imposed by the funds themselves rather than being inherent in the securities they hold—so, while hedge funds can and do command a fee premium, they cannot command a return premium for illiquidity.[5]

In our simulations, we assume that *half* of a given institution's alternatives allocation is in private equity funds that are subject to capital calls.[6] We further assume, fairly realistically, that the capital calls over three years sum to one-half the initial value of the private equity investment. Finally, we assume that there are no distributions of cash or securities from the private equity manager back to the investor over the three-year term of the simulations.[7]

Our assumptions are consistent with a new private equity program. We realize that few institutions are so naïve as to ramp up a private equity program to the troublesome size modeled in our simulations without any thought as to when they can expect distributions from the program. A large private equity position is likely to reflect a mature or laddered program, that is, one that provides a better cash-flow picture because the capital calls are offset—or more than offset—by the distributions. But we are

trying to understand worst-case scenarios, motivating our assumption of no distributions for three years.

A private equity program in which distributions are at least sufficient to meet capital calls is referred to as self-funding. A state of self-funding is a strongly desired goal for any private equity program, but it takes years from the initiation of the program to achieve.

WHAT ARE CURRENT ALLOCATIONS? HOW DID WE GET HERE?

High allocations to illiquid assets are nothing new. In the 1970s, pension funds typically defined their asset mix in terms of the amounts allocated to stocks, bonds, and real estate. REITs had just barely been invented at that time, so the real estate held by pension funds was almost entirely in private partnerships, which were composed of both real estate equity and real estate debt.[8] But over the period from roughly 1987 to 1994, the bear market in some sectors of the real estate market largely ended the prominence of real estate as an alternative asset in institutional portfolios. (We digress by pointing out that institutions largely missed out then on the subsequent real estate boom. The current real estate bear market will also end someday, and institutions should take heed not to miss out on the recovery this time.)

The current trend of allocating substantial assets to hedge funds and private equity, which began in the 1990s as real estate investing was being phased out, has gone quite far. Exhibit 1 shows average asset mixes of large foundations in 1997 and 2007 as reported by Cambridge Associates, a leading investment management consulting firm.[9] Exhibit 2 shows asset mixes in the same years for endowment funds other than foundations (a group that is, in fact, dominated by universities).[10] Thus, the subtle differences in investment policy between foundations and endowments can be seen in the exhibit.

The exhibits show that alternatives allocations have risen sharply over the past decade, mostly at the expense of fixed income. In addition, non-U.S. equities are now a much larger share of total assets compared to U.S. equities, which now have a smaller share.

Defined benefit (DB) pension plans hold, on average, much less in illiquid assets than endowments and foundations. Goldstein [2008] estimated that 12% of DB pension assets are invested in hedge funds, private equity, and real estate, combined. However, he points out that 40% of the dollar volume of consultant placements for DB pension funds is in hedge funds and private equity, and another 12% is in real estate. Consultant placements (i.e., assets placed by consultants into newly selected funds) are a measure of incremental or marginal changes in the asset

EXHIBIT 1

Average Asset Mixes of Large Foundations as of 1997 and 2007

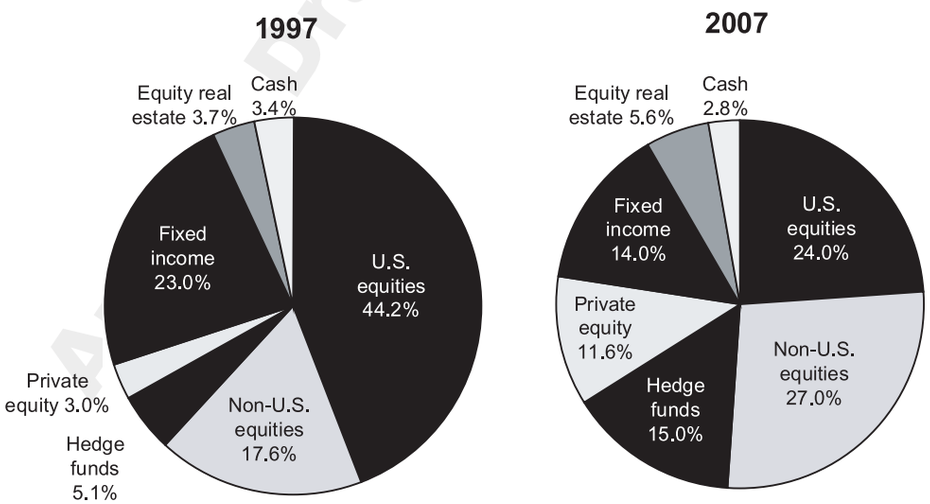

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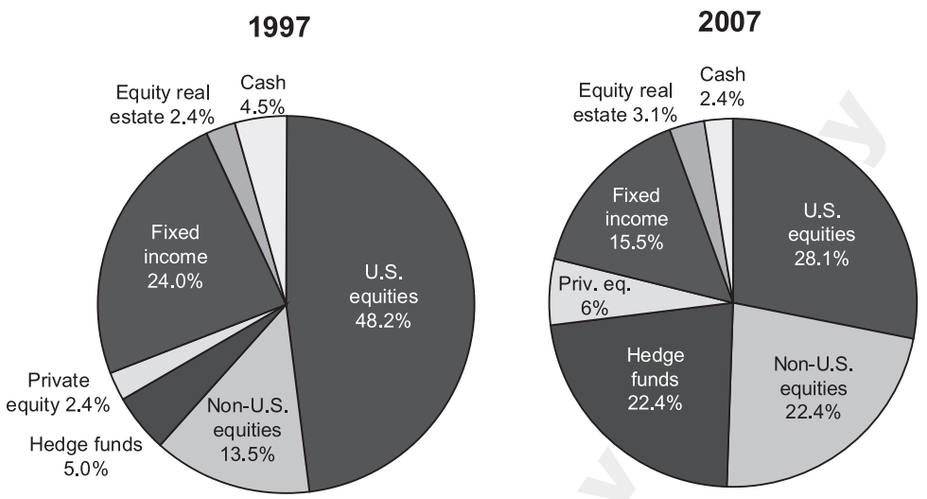
EXHIBIT 2

Average Asset Mixes of Endowments (Other than Foundations) as of 1997 and 2007



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or manager mix. Thus, the rate of movement by DB pension funds into illiquid assets is very high, albeit from a low base.[11]

Averages do not tell the whole story. The distribution around the average often reveals trouble when the average does not; remember the parable of the six-foot man drowning in a river that is, on average, four feet deep. Exhibit 3 shows the changing allocations, over time, of specific foundations that participate in a survey conducted, on an ongoing basis, by the Ford Foundation (the names of the institutions are omitted at the request of the institutions and replaced with Fund A, Fund B, and so forth; Fund F is the Ford Foundation).

Three facts emerge from the data in Exhibit 3. First, alternatives allocations have risen dramatically over time for every institution surveyed. Second, some institutions, like G, started with a toe in the water but then plunged in with both feet, raising their alternatives allocation at an extraordinary rate. And third, there is a thick cluster of funds with an allocation around 50% in alternatives, a hint of a cluster with an allocation around 16% to 21%, and one lonely fund in the middle. Assets counted as alternatives in this survey include private real estate, as well as hedge funds and private equity.

Just think about the data for a moment. An allocation at the bottom end of this range, around 15%, is unlikely to present a liquidity problem unless market conditions or spending plans cause the allocation to change dramatically in the future. In contrast, an allocation of 50% to illiquid asset classes is very high indeed, if the institution has nontrivial spending plans and little or no money coming in. An institution with such an allocation should at least question if it has enough liquidity—especially if the allocation is incurred rather suddenly. The middle cluster, naturally, has characteristics between those of the other two clusters. The remainder of the article stress tests this situation.

SIMULATION SETUP

We start with a portfolio of investments, a set of assumptions regarding cash flows into and out of the fund, and various market-outcome scenarios. For economy of language, we use the foundation convention of referring to cash flows into the fund as *contributions* and cash flows out of the fund as *payout*. Payout consists of grants for a foundation, transfers to the university operating budget for an endowment fund, and benefits to retirees for a pension fund. For each type of fund, operating expenses, such as staff salaries, are also considered a part of payout.

The starting portfolio of investments has an allocation to alternatives of either 15% or 50%. For the reasons

EXHIBIT 3

Alternatives Allocations of Specific Large Foundations, 1997–2007

Fund Survey Code	Percentage in Alternatives		
	12/31/1997	12/31/2002	12/31/2007
A	7%	32%	36%
B	22	43	49
C	2	10	21
D	14	38	52
E	18	42	48
F	8	12	16
G	1	5	50
H	0	na	54
I	na	21	52
J	na	na	46
K	16	28	42
L	13	26	52

noted earlier, the alternatives portfolio is invested half in private equity and half in hedge funds. The non-alternatives portfolio is split between global public equities and global public fixed income in a 70/30 proportion. There is no rebalancing.

The simulation period is three years. Although plenty can go wrong after that, three years is about the outer limit of hedge fund lockups and is also, roughly, the time it takes for a successful new private equity program to begin meaningful distributions. Thus, liquidity problems caused by alternatives exposure may begin to be mitigated by cash flows from alternatives after three years have elapsed.

EXHIBIT 4

Capital Market Assumptions for Simulations

	Year	Equities	Fixed Income	Alternatives
Capital Appreciation Returns				
NORMAL	1	8%	0%	10%
	2	8%	0%	10%
	3	8%	0%	10%
BEAR	1	–20%	–5%	0%
	2	0%	–5%	0%
	3	0%	–5%	0%
CATASTROPHIC	1	–20%	–5%	0%
	2	–20%	–5%	0%
	3	–10%	–5%	0%
Income Returns (Time- and Scenario-Independent)		2%	5%	0%

Capital market assumptions. Because we are modeling the availability of cash, we need to keep track separately of income returns and capital appreciation returns. We assume that income returns are received in cash and used both for payout and to meet capital calls before any securities are sold to meet liquidity needs. We use 2% as the income (dividend) return for global public equities, 5% for global public fixed income, and 0% for all alternatives (within the three-year time horizon). Capital appreciation returns depend on the market scenario and are provided in Exhibit 4.[12]

The normal, bear, and catastrophic market scenarios are characterized in Exhibit 4. We also ran a bull market scenario, but do not present the results in order to save space. As one might guess, a cash squeeze does not take place if public equity markets are rising sharply.

We have assumed that alternatives provide a *zero* total return in the bear market and catastrophic scenarios. A zero-return assumption is almost certainly too optimistic for private equity in the bear market cases, but hedge funds, if they are hedged (i.e., market neutral), should deliver the riskless rate, plus or minus their alpha and minus fees; thus, a zero return for such funds might be too pessimistic.[13] Combining private equity and hedge funds, our assumption of a zero return for alternatives in the bear market scenarios does not seem farfetched. Note that our assumption of a preferred return for alternatives in falling public markets is one source of the rising alternatives allocations. Even in the normal market scenario in which we have modeled alternatives as providing the same return as equities, the alternatives allocation still rises because of capital calls and because cash for spending is taken out of liquid assets.

Payout. We contemplated two payout scenarios: flexible and sticky. Flexible payout is a fixed percentage in each period of whatever the fund value is at the time. This scenario assumes that an institution can cut its grants, expenses,

and so forth at the same rate that it loses money in the market. Few foundations or endowments are this disciplined—and perhaps they do not need to be—but at least they have the option to reduce payout.[14] Sticky payout assumes that the institution does not reduce payout (in dollars) no matter what happens; this causes payout as a percentage of assets to rise if markets fall. A pension fund that cannot cut payments to beneficiaries exhibits sticky payout behavior.

Although we conducted the simulations under both flexible and sticky payout assumptions, the results are shown only for flexible payout (to avoid displaying a huge volume of exhibits). Needless to say, sticky payout has even worse implications for liquidity.

Contributions to the fund. We also have two contribution scenarios: none and equal-to-payout. These scenarios are self-explanatory. In the absence of forward capital commitments, contributions equal-to-payout would dramatically reduce any liquidity concerns, because the contributions could simply be used to make payout, leaving the investment portfolio alone. (A liquidity problem could still arise if the alternatives greatly outperformed the public securities.) With forward commitments, however, liquidity problems arise even if the fund is receiving contributions equal-to-payout.

Because private foundations face a 5% minimum payout requirement, and most of them are not receiving new donations, we model them as paying out 6% and taking in 0%. The 6% assumption is realistic in practice because only grants and operating expenses—not investment expenses, which often total 1% or more—count toward meeting the statutory 5% minimum. In addition, many foundations simply elect to pay out more than they are required to.

University endowments do not face any minimum payout requirement and for such institutions 4% is a more typical annual payout rate.[15] We assume that a university endowment receives new contributions equal to the amount paid out. In practice, most universities do not receive contributions quite this large, but for simplicity we assume that they do.

Defined benefit pension funds are like university endowments in that contributions may offset payout or go a long way toward doing so. One goal of a pension fund, however, is to minimize the required contribution from the sponsor and to generate much of the cash needed to pay benefits through market returns. Thus, it is quite aggressive to assume that contributions are equal to payout on a current, cash-on-cash basis for a pension fund. But this is closer to the truth than to assume that there will be *no* contributions. Therefore, the simulations involving contributions equal-to-payout should be of interest to pension plan managers, although we would caution that they might paint too rosy a picture, and that the real outcome is somewhere between the no-contribution case and the contribution-equal-to-payout case.

Forward commitments. We have assumed that half the initial allocation to alternatives is to private equity and that, at the starting date of the simulation, the forward commitments to private equity are equal, in dollars, to one-half the amount already invested in private equity. Thus, forward commitments at the start of the simulation are equal to 25% of the overall allocation to alternatives. We assume that the forward commitments are fully drawn down in equal annual installments (capital calls) over the three-year life of the simulation, and that no further commitments involving additional capital calls during the simulation period are made.

Some readers may complain that the assumptions are too simplistic or the scenarios insufficiently granular. However, the results—that illiquidity is a concern for institutions with high initial alternatives allocations—are dramatic enough that, given falling markets, they would not be greatly altered by changing the assumptions, *except* by doing one or more of the following:

- Managing forward commitments much more carefully by building the private equity program gradually; while this is standard operating procedure at some organizations, it is not a practice universally followed.
- Receiving contributions that are large compared to payouts.
- Borrowing.

Another option is that the institution could allocate less to illiquid alternatives. The results for a 15% starting alternatives allocation are relatively, although not entirely, benign.

SIMULATION RESULTS

The results of our simulations are explained in this section, as well as the impact of portable alpha in down markets and gating provisions of hedge funds on liquidity.

Normal Market

Exhibit 5 presents the results in normal markets, or markets in which the realized return is about equal to the expected return. Note that we keep track not only of the stocks-bonds-alternatives mix, but of fund value, which is assumed to have a starting value of $1,000,000.

Note that for an institution with a 6% spending rate and no contributions (for brevity, we call this a foundation), the alternatives allocation rises quite sharply despite the fact that alternatives are not outperforming equities. This rise is due to 1) capital calls, 2) the fact that all spending is out of the public equity and fixed-income portfolios, and 3) least importantly, that alternatives are outperforming public fixed-income. With a 15% starting allocation to alternatives, however, the subsequent rise in that allocation (to 22%) over three years is not distressing—it may even be desired—and it is certainly not threatening to the institution's ability to raise cash for spending. With a 50% starting allocation, however, the subsequent rise in that allocation (to 74%) raises alarms. At the end of three years, the value of the remaining liquid securities is equal to only a little more than four years' spending.

There is no specific threshold at which we can say that the alternatives allocation for a given institution is too high, but a 74% alternatives allocation is far in excess of what most institutions desire or have the skills to manage. Yet, the foundation in this example is not in deep trouble. Hedge fund lockups have expired, so the institution can redeem its hedge fund shares, if necessary. Distributions from the private equity portfolio are about to begin in earnest.

For an institution with a 4% contribution rate and a 4% payout rate (for brevity, we call this a university), the growth in the alternatives allocation is more benign. The 50% starting allocation rises to 62% over the three-year period. The remaining 38% represents almost 10 years' spending (a university's spending rate is lower than that of a foundation), and the institution continues to take in new money. Thus, no liquidity problem exists in the normal market scenario.

Bear Market

Exhibit 6 shows the results for an ordinary (20%) bear market in equities, with no recovery in the subsequent two years.

In this "ordinary" bear market, a foundation is still in a fairly good liquidity position if it starts with 15% in alternatives. This allocation rises to 25%, perhaps not what the institution intended, but typical of many of this hypothetical foundation's peers. Note, however, that the

EXHIBIT 5
Simulation Results in Normal Markets

15% STARTING ALTERNATIVES ALLOCATION					50% STARTING ALTERNATIVES ALLOCATION				
Yr	Equities	Fixed	Alt	Fund value	Yr	Equities	Fixed	Alt	Fund value
6% spending, no contributions					6% spending, no contributions				
0	60%	25%	15%	$1,000,000	0	35%	15%	50%	$1,000,000
1	58%	25%	17%	$1,027,250	1	30%	13%	57%	$1,032,500
2	56%	24%	20%	$1,055,594	2	24%	10%	65%	$1,067,188
3	54%	23%	22%	$1,085,111	3	18%	8%	74%	$1,104,293
4% spending, 4% contributions					4% spending, 4% contributions				
0	60%	26%	15%	$1,000,000	0	35%	15%	50%	$1,000,000
1	59%	25%	16%	$1,087,250	1	32%	14%	54%	$1,092,500
2	58%	25%	18%	$1,182,329	2	29%	13%	58%	$1,194,238
3	57%	24%	19%	$1,285,954	3	26%	11%	62%	$1,306,173

institution has lost almost one-quarter of its fund value. Spending, no new money, a high initial equity allocation, and declining markets are not a good combination.

If the foundation started with 50% in alternatives, however, it would find that allocation radically larger after the bear market (80%). Only a little over an amount equal to three years of spending is left in liquid assets. If, at that point, there are any forward capital commitments to private equity firms (from new commitments made after the start of the simulation time period), the institution is in danger of needing to borrow or to sell alternative asset positions in the secondary market. The easiest route back to liquidity at this point is to redeem hedge fund shares, which are no longer locked up.

The university is in better shape. A 15% starting allocation to alternatives ratchets up to only 21%. A 50% starting allocation moves to 66% as a result of the bear market, leaving eight-and-a-half years of spending in liquid assets. Few universities would intentionally allocate such a high percentage to illiquid asset classes. Most could survive this bear market, however, and over time would reduce their alternatives allocation by gradually redeeming hedge fund shares and being mindful not to make excessive further commitments to private equity funds.[16]

Catastrophic Market

Exhibit 7 shows the results for a three-year market decline on a par with the events of 1973–1974 or 2000–2002. (An even more catastrophic scenario, such as the 1929–1933 decline of 86% in the S&P 500 on a month-end to month-end basis, seems too horrible to contemplate.) In *our* catastrophe, the one that we *can* bear to contemplate, the market declines by 20% in each of the first two years, then an additional 10%, for a total top-to-bottom decline of 43%.

For a foundation with a 15% starting alternatives allocation, the catastrophic market scenario produces a disturbing doubling of the allocation. Still, a 30% allocation to alternatives is not an untenable position. The real worry is that the institution, exposed to the equity market collapse, has lost (after spending is deducted) almost 38% of its assets.

With a 50% starting alternatives allocation, an institution with 6% spending and no contributions is just about wiped out of liquid assets. Alternatives sum to 87% of the fund, and public equities and bonds make up only 9% and 4%, respectively. Liquid securities, at that point, provide for only a little more than two years of spending. Before deciding to sell the headquarters building and

EXHIBIT 6
Simulation Results in Bear Markets

15% STARTING ALTERNATIVES ALLOCATION					50% STARTING ALTERNATIVES ALLOCATION				
Yr	Equities	Fixed	Alt	Fund value	Yr	Equities	Fixed	Alt	Fund value
6% spending, no contributions					6% spending, no contributions				
0	60%	25%	15%	$1,000,000	0	35%	15%	50%	$1,000,000
1	56%	24%	20%	$832,900	1	27%	11%	62%	$877,000
2	55%	23%	22%	$792,312	2	21%	9%	70%	$829,075
3	52%	22%	25%	$753,410	3	14%	6%	80%	$782,754
4% spending, 4% contributions					4% spending, 4% contributions				
0	60%	25%	15%	$1,000,000	0	35%	15%	50%	$1,000,000
1	57%	25%	18%	$892,900	1	30%	13%	58%	$937,000
2	56%	24%	19%	$903,126	2	27%	11%	62%	$942,535
3	56%	24%	21%	$913,314	3	24%	10%	66%	$947,547

spend itself out of existence, the institution should check to see if its hedge funds, assumed to be fully liquid after three years, have really delivered the 0% performance we assumed in the simulation. If the hedge funds delivered as expected, the institution can recover, although it will be a struggle. But if alternatives have tanked along with public equities, the strategy must be judged as having failed.

With a 50% starting alternatives allocation, our catastrophic market scenario also knocks the wind out of the university, although, as one would guess, not quite as thoroughly as for the foundation. The resulting 72% alternatives allocation is quite unlike anything ever experienced by most institutions and would require considerable skill to be nursed back to more prudent levels. The remaining 28% in liquid securities represents seven years of spending. Once again, the new money coming into the fund makes a tremendous difference, but this is not the asset mix of a healthy endowment fund.

Portable Alpha Programs Affect Liquidity in Down Markets

John Minahan of NEPC, LLC, notes that the worst-case scenario may be worse than shown in Exhibit 7. Many institutions with large alternatives programs also use portable alpha strategies involving derivative contracts. The derivatives positions are typically long because they are used to convert market-neutral investments to market-exposed investments. In a down market, such positions generate margin calls, which must be met in cash. These margin calls must be added to spending and capital calls as drains on liquidity in down markets.

Do Alternatives Really Preserve Capital in Collapsing Markets?

In our simulations with a 50% starting alternatives allocation, the return performance of both types of institutions is quite good (considering the collapsing equity market). This occurs because we have assumed that the alternatives portfolio enjoys a 0% return, and because the allocation to equities becomes smaller over time. Thus, if alternatives really perform this well in a catastrophic market, there is a tradeoff to be made—alternatives preserve capital, while swallowing liquidity whole. The big "if" here, of course, is the zero-return assumption for alternatives. If hedge funds are fully hedged so that they have a zero beta with respect to equities and other market factors, a zero-return assumption is reasonable, maybe

EXHIBIT 7
Simulation Results in Catastrophic Markets

15% STARTING ALTERNATIVES ALLOCATION					50% STARTING ALTERNATIVES ALLOCATION				
Yr	Equities	Fixed	Alt	Fund value	Yr	Equities	Fixed	Alt	Fund value
6% spending, no contributions					6% spending, no contributions				
0	60%	25%	15%	$1,000,000	0	35%	15%	50%	$1,000,000
1	56%	24%	20%	$832,900	1	27%	11%	62%	$877,000
2	52%	22%	25%	$698,456	2	18%	8%	75%	$782,128
3	49%	21%	30%	$627,254	3	9%	4%	87%	$724,133
4% spending, 4% contributions					4% spending, 4% contributions				
0	60%	25%	15%	$1,000,000	0	35%	15%	50%	$1,000,000
1	57%	25%	18%	$892,900	1	30%	13%	58%	$937,000
2	55%	23%	22%	$800,870	2	24%	10%	66%	$887,188
3	53%	23%	25%	$765,840	3	19%	8%	72%	$870,237

even conservative. As Asness [2003] showed, however, the majority of hedge funds do not hedge in this manner. Private equity firms have usually delivered poor returns when public equity markets are deeply depressed.[17]

Gating Provisions for Hedge Funds

A final warning is that the assumption of complete liquidity for hedge funds, even after a three-year lockup period has elapsed, may not hold. Hedge funds also typically impose *gating provisions*, which stipulate that if redemption is sought for more than a stated percentage, say 25%, of the outstanding shares of a hedge fund within a given time period, the redemption is disallowed or a slower redemption schedule is imposed. Such a flood of redemption requests almost always takes place when performance has been poor. Gating provisions are a useful tool for preventing runs on the fund in which the manager would have to liquidate positions under pressure, presumably at disadvantageous prices. Gating provisions do, however, further limit liquidity. We have ignored gating provisions in our simulations, but investors in the real world cannot ignore them.

ADVICE TO THE INVESTOR: "LADDER" THE ALTERNATIVES PORTFOLIO

The lesson one most easily might take away from this analysis is that institutions are moving too far out on the liquidity risk curve and can expect problems. These problems can largely be avoided, however. So far, we have not indicated in any detail the design of an alternatives program that helps immunize against a liquidity squeeze, but we will now do so.

Most importantly, a private equity program should be built gradually by laddering the portfolio (analogous to building a laddered portfolio of bonds), to mirror a realistic expectation of distributions, which fully, or mostly, offset capital calls by the time the private equity portfolio approaches a 25% share of the total fund. (When distributions equal capital calls, a private equity portfolio is referred to as self-funding.) Some sophisticated institutions use a *pacing* spreadsheet to model capital calls and distributions under a variety of scenarios in order to specifically avoid making commitments that would cause the problems we have warned about.

The difference between laddering a bond portfolio and an alternatives portfolio is that the bond ladder can be put in place at one time by buying bonds with different maturities. As used here, laddering means that an investor should make commitments *over* time.

The advice to ladder into a position over time also applies to hedge funds and other alternative asset classes. The key to achieving a self-funding alternatives program is to avoid setting a large target allocation and feeling compelled to fill it right away. An example of a laddered strategy is the one followed by the Massachusetts Institute of Technology endowment fund, which set a five-year target over which the staff had time to grow the allocation toward the allocation they wanted. This was done in each alternatives sector—private equity, hedge funds, real estate, and natural resources. A laddering or build-up period even longer than five years may be desirable.

The Ford Foundation, with no new money coming in and mindful of liquidity needs, has not only built up its alternatives program at a measured pace, but has established an alternatives allocation much lower than many of its peer institutions. As of this writing, 22.5% of the Ford Foundation's asset value is in private equity and hedge funds, combined.

In addition, the quality of the managers, not the quickness of achieving the allocation, should be the main criterion that any institution should satisfy in reaching a target allocation to an alternative asset class. If the allocation is achieved quickly, there is almost no way to avoid investing with average or below-average managers.[18] And in these asset classes, the difference between the best managers and the rest is much greater than in the world of long-only, publicly traded equities and bonds.[19] Experienced practitioners know this, and also almost universally believe that this return difference is more persistent over time—but newcomers to alternative asset investing may not.

At the risk of repetition, we should also point out that institutions with no new money coming in, what we have called foundations, need to be much more sensitive to liquidity concerns than universities and other organizations that have cash flow into their funds. This effect is real and dramatic—new money greatly ameliorates the problems caused by illiquidity from high alternatives allocations.

Foundations, and perhaps other endowments, due to their need for cash, may be able to obtain a special provision from hedge funds that allows them to withdraw, say, 5% per year during the lockup period. Any institution that can gain this little bit of extra liquidity should do so.

It should go almost without saying that by modeling liquidity under normal, bear, and catastrophic conditions, we have shown the vital importance of planning for the worst-case scenario. If an investor assumes normal markets going forward but gets bad markets instead, he may well have to supply liquidity to a third party when, in fact, he is required to demand it for his beneficiaries, grantees, or employees.

CONCLUSION

In summary, the three dimensions of investment management are sometimes said to be return, risk, and costs. Costs can be more or less controlled by the investor. Risk is harder to control, but the investor can still achieve some degree of influence over it. Return is the hardest to control. There is a fourth dimension of investment management—liquidity—over which the investor exercises considerable control. All asset pools have been brought into being to pay some sort of cash liability or to satisfy some other kind of eventual cash need. In today's markets, with many of the most popular asset classes being illiquid, investors need to devote substantial attention to liquidity so that the goal for which the asset pool was assembled can be achieved.

ENDNOTES

The author is deeply indebted to Allan Bufferd, retired chief investment officer of the Massachusetts Institute of Technology and now scholar in residence at the Foundation Financial Officers Group, who commented on the implications of the analysis for university endowments, and who also provided much of the advice in the final section; Jason Zweig, who carefully reviewed the article and who made many improvements; and Linda Strumpf, chief investment officer of the Ford Foundation, who suggested the topic and the general approach. Christopher Barber, Peter Bernstein, Michael Blake, Eric Doppstadt, Barclay Douglas, Ian Kennedy, John Minahan, Stephen Nesbitt, Ron Schmitz, Clinton Stevenson, and Rodney Sullivan provided many thoughtful comments. Timothy Aurthur programmed the analysis very swiftly and accurately.

[1]If an investor objects to the Sharpe ratio, this observation applies to whatever risk-adjusted return measure they use. Irrational reasons for high allocations to alternatives include the cumulative effect of past returns (i.e., having increased in value, alternatives comprise a larger portfolio share than the initial allocation) and various forms of behavior usually attributed to lemmings or herds.

[2]To see how forward commitments should probably be understood as leverage, consider the prototypical high-alternatives-allocation fund that we use in our simulations. This hypothetical fund consists of 35% in public equities, 15% in public fixed-income, 25% in hedge funds, and 25% in a new or "immature" private equity program that has not started distributing cash and securities back to the investor. Moreover, in our modeling, the private equity managers have the right to call additional capital equal to 12.5% of the total fund. The capital calls must thus be funded either by selling public equities and bonds, or, if one wants to leave the equity and bond portfolios alone, through borrowing (or by receiving new contributions if the institution is of the type that does so). The only reasonable conclusion is that the fund is not 100% invested, but 112.5% invested. It is a leveraged fund, one that can theoretically (although it is very unlikely) lose more than 100% of its invested capital and leave the investor still in debt.

[3]The secondary market in private equity is growing, so that investors who want to sell their positions may face a smaller discount and wider variety of potential buyers than they did in the past, but costs remain much higher than in the public markets.

[4]It remains to be seen whether private equity faces capacity constraints to the extent that hedge funds do, but the burden of proof is clearly on the optimists to prove the skeptics wrong.

[5]This is not to say that some hedge funds will not have excellent returns, but they will have to earn them the old-fashioned way, by selecting superior liquid securities (and shorting inferior ones).

[6]While the term *private equity* is sometimes used to mean just buyout firms, we use it to mean buyout firms plus venture capital firms, which we believe is a better nomenclature.

[7]These issues are also addressed in considerable detail in Takahashi and Alexander [2002]. While our capital call assumptions differ in their specifics from those found in the Takahashi and Alexander article, they are broadly consistent with it.

[8]REITs were created by an act of Congress in 1969, but were rarely used until the 1980s. There were a few exceptions, however, such as the notorious Chase Manhattan Mortgage and Realty Trust that generated enormous institutional losses in the mid-1970s.

[9]We have relabeled some of the asset classes to fit our nomenclature. What Cambridge Associates calls *marketable alternatives,* we have labeled *hedge funds*. And what Cambridge Associates calls *nonmarketable alternatives*, we have labeled *private equity*.

[10]The 2007 data in Exhibits 1 and 2 are as of September 30. On that date, the 30 large foundations in Exhibit 1 had an unweighted average asset size of $5.9 billion and ranged in asset size from $455 million to $37 billion. The 263 institutions in Exhibit 2 are of all sizes (not just large institutions) and had an unweighted average asset size of $1 billion with a

range of $15.4 million to $19.9 billion. The 1997 data in Exhibits 1 and 2 are as of June 30. On that date, the 27 foundations in Exhibit 1 had an unweighted average asset size of $2.5 billion and ranged in asset size from $271 million to $10.2 billion. The 182 institutions in Exhibit 2 had an unweighted average asset size of $600 million with a range of $8.4 million to $12 billion.

[11]The 7% hedge fund and private equity allocations and the 5% real estate allocation are as of 2006 and are asset size-weighted averages. The consultant placements data are for 2007.

[12]We ignore share buybacks in estimating the dividend yield. Furthermore, to simplify the analysis we assume that the dividend yield on the equity portfolio is constant. In practice, dividend yields tend to rise in a bear market. In addition, a 5% income assumption is high considering the recent sharp decline in global bond yields, but it is typical, on average, over time, and we have to stop updating the simulations at some point!

[13]Many hedge funds do not fully hedge their equity exposure; they have positive equity betas, and these betas have risen over time (see Asness, Krail, and Liew [2001]). Therefore, hedge funds as a broad category (not just market-neutral hedge funds) might earn a negative return in a bear market.

[14]The regulations regarding mandated minimum payouts for private foundations are somewhat more complex, but flexible payout of 5% is a very good first approximation.

[15]To smooth payout, many universities calculate payout as a percentage of a three-year trailing average of asset values. Based on such an average, a typical payout rate is on the order of 4.5% to 4.8%. In rising markets, this translates to about 4% of current-year asset value.

[16]We have assumed that, in all scenarios and for both types of institutions, no *further* capital commitments are made to private equity funds beyond those present at the start of the simulation.

[17]See Kaplan and Schoar [2005].

[18]This is in contrast to traditional asset classes, for which the target allocation can be reached immediately, using index derivatives, while a manager search is conducted.

[19]See Kaplan and Schoar [2005] and Nesbitt [2008]. Nesbitt found that, for the 10-year period ending December 31, 2007, the interquartile range (the spread, expressed as the difference in annualized returns, between the 25th and 75th percentile managers) was a scant 0.5% for fixed-income managers, 2.7% for U.S. equity managers, 3.9% for international equity managers, 7.4% for hedge funds, 14.2% for private equity buyout firms, and 35.6% for private equity venture capital firms.

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