Part One

REAL MONEY AND THE CRASH OF '08

Those who cannot remember the past are condemned to repeat it.

—George Santayana

Chapter 1

Rethinking Real Money

I. Why Real Money?

Real money is a commonly used term in the financial markets to denote a fully funded, long-only traditional asset manager. Real money managers are often referred to as institutional investors. The term real money means the money is managed on an unlevered basis. This contrasts with hedge funds, which often manage money using borrowed funds or leverage. Real money funds can and often do employ leverage, but they normally attain leverage on a nonrecourse basis (e.g., investing as a limited partner in a fund that is levered). Examples of real money managers are public and private pension funds, university endowments, insurance company portfolios, foundations, family offices, sovereign wealth funds, and mutual funds.

This book focuses on the mistakes made and lessons learned in 2008 and attempts to incite a dialogue about how to construct better portfolios in the real money world. For this reason, mutual funds

will be excluded from the discussion, since they are usually managed under strict mandates and asset class restrictions, rather than as broad portfolios where asset allocation decisions dominate the investment process.

Real money funds are important and worth analyzing because: (1) they are some of the largest pools of capital in the world; (2) they have a direct impact on the functioning of society; (3) they lost staggering amounts of money in 2008; and (4) in many cases, these funds are ultimately backstopped by the taxpayer if they fail to deliver their promises. Real money funds are in crisis and are "too big to fail."

Size

Real money funds comprise a majority of world's managed assets, which totaled $62 trillion at the end of 2008. Within this grouping, pensions are by far the largest category, at $24 trillion, with U.S. pensions at $15 trillion, or almost one-quarter of total managed assets (see Figure 1.1).

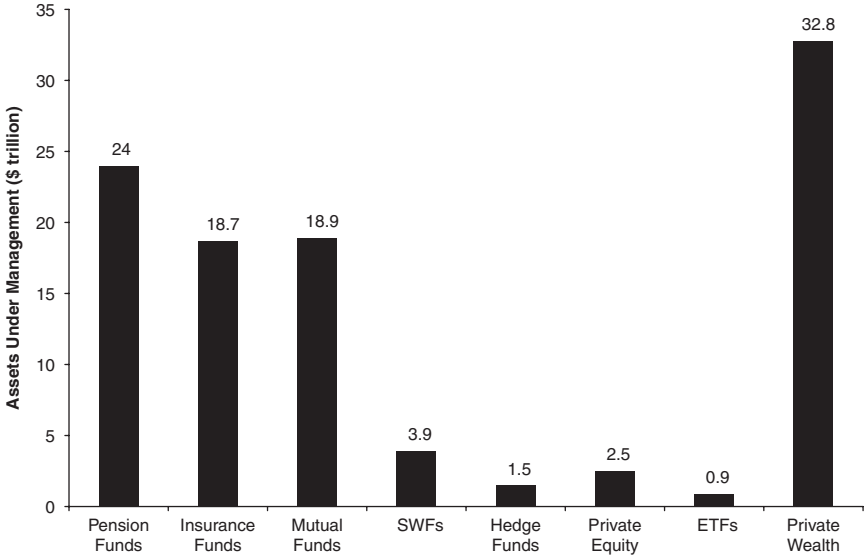

Figure 1.1 Global Fund Management Industry, End of 2008
SOURCE: IFSL estimates.

Impact on Society

Much of real money exists to deliver the promise of future retirement benefits, to support education, to guarantee the payouts from insurance agreements, to support charitable activities, and even to back national interests. In short, real money is the foundation for many important aspects of modern society. Pensions form an important part of the fundamental social contract between workers and employers, both in the public and private sectors. Public pensions in particular help ensure that basic societal functions are populated by competent people. Some of these functions include: police officers, firemen, judges, sanitation workers, teachers, health workers, politicians, and soldiers, amongst many others. To give an example of how real money affects society, after the crash of 2008, Philadelphia city officials threatened to lay off workers and cut sanitation and public safety services unless they could delay pension contributions. Stories such as these will likely become much more prevalent over the next few years.

2008 Losses

During the financial crisis, real money accounts suffered immense drawdowns. Pension funds globally saw their assets fall by almost 20 percent, while university endowments in the United States lost 26 percent on average. More surprisingly, because of the severity of investment losses, many institutions were forced to modify their operations to reflect a new reality: universities laid off staff, froze or cut salaries, issued debt, reduced financial aid, and suspended building projects; pensions increased employee and employer contributions, raised retirement ages, and cut benefits; charitable foundations canceled grants and delayed new programs; families curtailed spending and in many cases have been forced to sell assets.

The severe losses in 2008 also exposed some fundamental flaws in how real money portfolios are managed. Portfolio construction methodologies failed to account for both worst-case scenarios and potential illiquidity. A primary lesson of this experience is that the pain of investment losses is not linear; there is a kink, after which point losses

begin to force changes in behavior. As a result, short-term investment performance has consequences even for "long-term" investors.

Taxpayer

Although all real money accounts are important to society in one way or another, pensions are the largest and arguably the most important. Well before the crisis of 2008, demographic challenges had been steadily putting pressure on pension systems in the developed world. Nevertheless, at the end of 2007, after an extended bull run for assets, many plans were fully funded, whereas at the end of 2008 most had become significantly underfunded.

Although a university going bust or a charitable foundation closing down is tragic for those directly involved, the effect would be relatively isolated. On the other hand, a pension fund going bust has implications for taxpayers. In the United States, the taxpayer is the explicit backstop for public pension funds and the implicit backstop for corporate pension funds, the latter of which are guaranteed by the Pension Benefit Guaranty Corp. (PBGC), a federal agency. The PBGC is currently facing its own crisis, with a reported deficit of $33.5 billion at midyear 2009, a more than tripling of the $11 billion deficit reported at midyear 2008. The deficit is the largest in the agency's 35-year history. More importantly, without confidence by workers that their benefits are intact, society breaks down.

In Ohio, for instance, the teachers pension system reported that it could take 41 years for its investments to meet its liabilities to retirees based on actuarial assessments—and this was *before* 2008. During the 2008–2009 fiscal year, the pension fund lost 31 percent, prompting officials to claim that they would never be able to meet liabilities. Because of the inherent complexity and subjectivity associated with calculating the funding levels for pension funds, the true costs are often disguised in the near-term (see box on page 7).

The shortfall associated with underfunded pensions can be made up by either investment performance or pension reform (i.e., changing the structure of the pension in some way). Yet pension reform amounts to fiscal tightening at a time when the global economy is weak and

personal budgets are stretched. At the same time, these decisions are made by politicians, whose tenure in office does not compel them to make difficult, long-term decisions. Because voters do not opt for more tax or less benefits, the problems are often ignored, growing bigger by the day. Pensions loom as the next big financial crisis.

But crises often bring about change. We now have new information, which raises many important questions about what to do going forward. In order to understand more clearly what happened in 2008 and be able to formulate a plan for where we go from here, it is worthwhile to examine a brief history of real money, focusing on the U.S. pension world because it is the largest pool of funds and the biggest risk to the taxpayers of the world's largest economy.

Pension Funding Levels

Pension plans have two primary elements: (1) the future benefit obligations earned through employee service; and (2) the plan assets available to meet the liabilities owed to the beneficiaries. The challenge in assessing the health of pension plans is that both future liabilities and returns are estimates.

Since the payments to beneficiaries will be made far into the future, actuarial assumptions are required to estimate mortality rates, medical costs, and future salary increases. The future stream of assumed payments is discounted into a single present value estimate, whereby the discount rate is determined by reference to a benchmark yield. The higher the discount rate, the lower the benefit obligations. Very small changes in the discount rate have enormous real dollar implications for estimated funding levels.

Likewise, the value of plan assets available in the future to meet the pension obligations is also an estimate. The future value calculation is a function of expected returns on plan assets. Expected long-term returns are often developed using historical or "assumed" rates of return. In sum, it's a big guessing game.

II. The Evolution of Real Money

In the Beginning, There Were Bonds

Although pensions have existed for hundreds of years, the current structure took shape after 1948. In that year, the U.S. National Labor Relations Board (NLRB) ruled that corporate pensions must be included in contract negotiations between employers and employees. Before the ruling, the amount of capital allocated to an employee pension scheme, if such a plan even existed, was at the employers' discretion. This ruling defined how much a corporation must contribute to the employee pension plan annually, regardless of company performance and profits. As a result, money began to consistently move into pension funds, creating significant growth in assets and eventually leading to the large, powerful, professionally managed institutions that exist today (see Figure 1.2).

At the time, pension assets were managed very conservatively; fixed interest on bonds was matched to meet fixed commitments to pensioners—simple asset/liability matching. Bonds were selected from preapproved "legal lists" of securities, and it was common to have a limit for equities. In 1949, public and private pension assets in the United

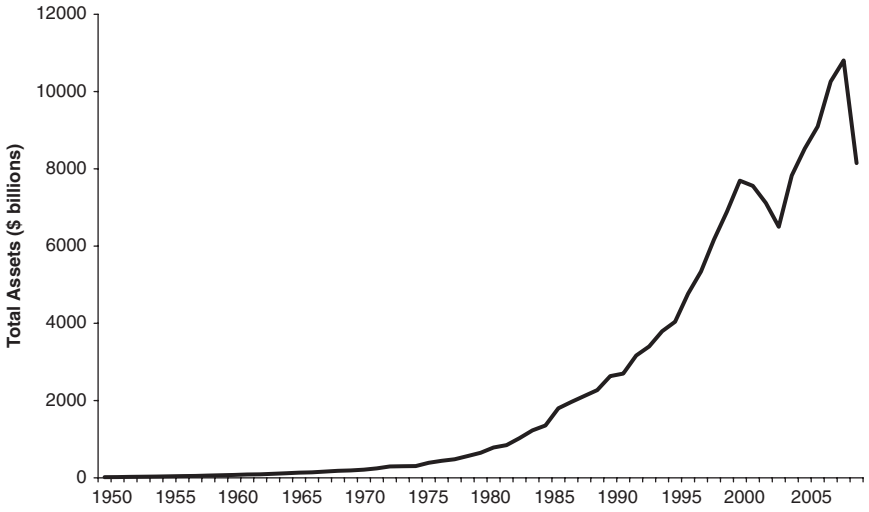

Figure 1.2 Growth of US Public and Private Pension Fund Assets, 1950–2008
SOURCE: Federal Reserve Flow of Funds.

States were $15.7 billion. The asset mix was roughly half in government bonds, and half in other fixed income and insurance company fixed annuity investment products. There was minimal exposure to equities.

Along Came Inflation

By 1970, public and corporate pension fund assets in the United States reached $211.7 billion, the majority of which was concentrated in fixed income. Beginning with the 1973–1974 oil embargo, wave after wave of commodity price-induced inflation roiled fixed interest portfolios through the remainder of the decade. Nevertheless, assets continued to pour into pension funds because of strict commitments mandated on employers.

At the end of the decade, U.S. pension funds had $649 billion in total assets, and the outperformance of equities versus bonds during the previous ten years did not go unnoticed by pension fund managers. While bond portfolios got destroyed, equities at least managed to preserve capital in real terms (see Figure 1.3). Panicked and weary pension fund managers began rethinking their portfolios, and the shift out of bonds

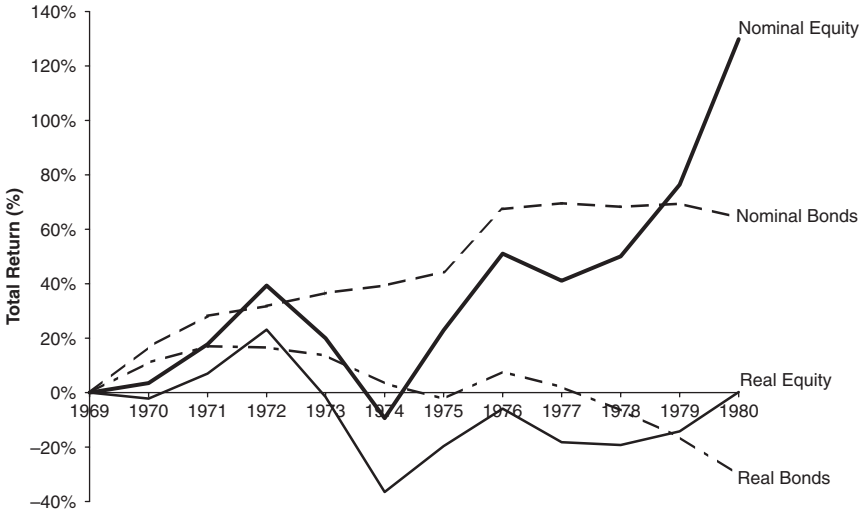

Figure 1.3 U.S. Stocks and Bonds, 1970s
SOURCE: Bloomberg; U.S. Bureau of Labor Statistics, http://www.bls.gov/CPI/; and *Damodaran Online*, http://pages.stern.nyu.edu/~adamodar/.

into stocks began in earnest. By 1980, corporate pensions had 45 percent of their assets in equities, while public pensions had 16 percent. In many cases, public plans were still capped as to how much equities they could own. The largest U.S. pension fund, the California Public Employees' Retirement System (CalPERS), for example, had a maximum allocation to equities of 25 percent, which was eventually lifted in 1984.

The 60–40 Model and the Great Moderation

Through the 1980s and 1990s, pensions continued to shift their assets out of bonds and into stocks, ultimately moving toward the now ubiquitous 60–40 policy portfolio (60 percent in stocks and 40 percent in bonds, often domestic only). The 60–40 model which became the standard benchmark by which to judge portfolio performance. The shift into stocks, and corresponding increase in risk, occurred in lock step with Federal Reserve Chairman Paul Volcker's famous battle with inflation, which saw the fed funds rate peak at 20 percent in 1981. In 1980, the so-called "misery index"—unemployment plus inflation—peaked at 20 percent.

As the excess pessimism of the 1970s gave way to excess optimism during the Reagan 1980s and euphoria during the technology revolution of the late 1990s, 60–40 pension portfolios performed well. The big decisions that investors faced at this time were whether to tweak the 60–40 allocation to, say, 65–35 or 55–45. In actuality, the market environment throughout the 1980s and 1990s rendered these decisions inconsequential as both stocks and bonds benefited greatly from falling inflation and declining interest rates. The environment later became known as the Great Moderation, and was summed up well in a 2004 speech by then–Federal Reserve Governor Ben Bernanke (see box).

Bernanke on the Great Moderation

The Great Moderation, the substantial decline in macroeconomic volatility over the past twenty years, is a striking economic development. Whether the dominant cause of the Great Moderation is structural change, improved monetary policy, or simply good luck is an important question about which no

consensus has yet formed. I have argued today that improved monetary policy has likely made an important contribution not only to the reduced volatility of inflation (which is not particularly controversial) but to the reduced volatility of output as well. Moreover, because a change in the monetary policy regime has pervasive effects, I have suggested that some of the effects of improved monetary policies may have been misidentified as exogenous changes in economic structure or in the distribution of economic shocks. This conclusion on my part makes me optimistic for the future, because I am confident that monetary policymakers will not forget the lessons of the 1970s.

SOURCE: Board of Governors of the Federal Reserve System, www.federalreserve.gov; February 20, 2004.

By 1998, U.S. pension assets totaled more than $6.9 trillion, 438 times the 1949 figure. Pensions were larger than the national debt and growing faster. Because of their immense buying power, pensions became powerful market players in terms of shareholder activism, governance, and reform (see Figure 1.4).

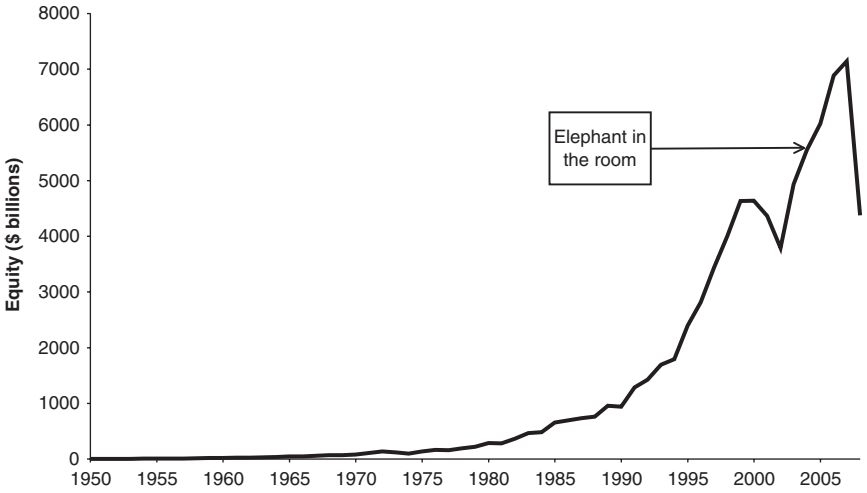

Figure 1.4 Equity Assets Owned by US Public and Private Pensions, 1950–2008
SOURCE: Federal Reserve Flow of Funds.

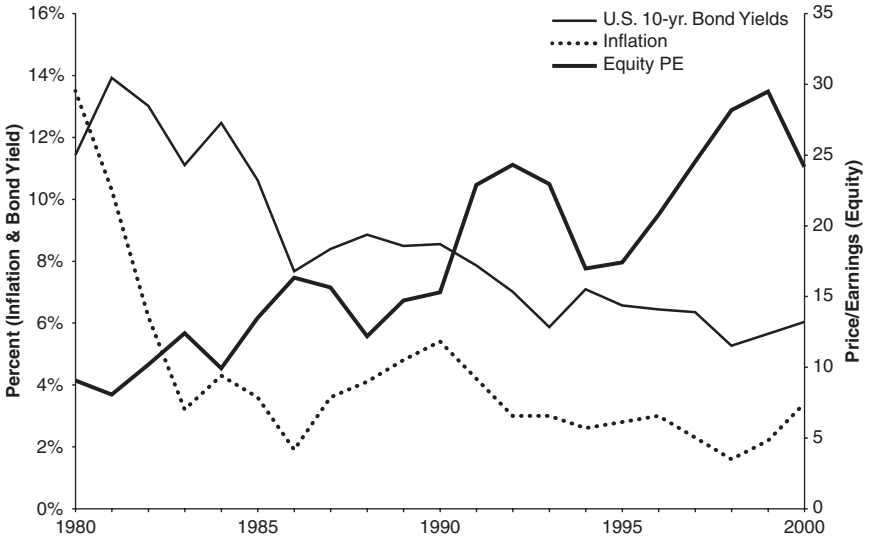

Figure 1.5 Interest Rates, Inflation and Equity Multiples, 1980–2000
SOURCE: Bloomberg; Federal Reserve System, http://www.federalreserve.gov/datadownload/; and U.S. Bureau of Labor Statistics, http://www.bls.gov/bls/.

For two decades, the trend in equity markets was almost straight up, producing an entire generation of real money investors conditioned to buy any dip and remain invested in equities for the long term. Academics such as Jeremy Siegel of the University of Pennsylvania and bank strategists such as Abbey Joseph Cohen of Goldman Sachs became cheerleaders for the idea of owning equities for the long term, while banks and consultants peddled the story. Pensions, other real money investors, and retail investors all made money in this environment. It was a wonderful time to be invested (see Figure 1.5).

The Dot-Com Crash

As real money was becoming increasingly loaded up on equity risk in their 60–40 portfolios (stocks can be anywhere from 2 to 10 times riskier than bonds depending on what proxies are used), two decades of declining inflation and interest rates culminated in a technology-led stock market bubble that finally popped in March 2000. After the peak, global equity markets declined relentlessly year after year, finally bottoming in

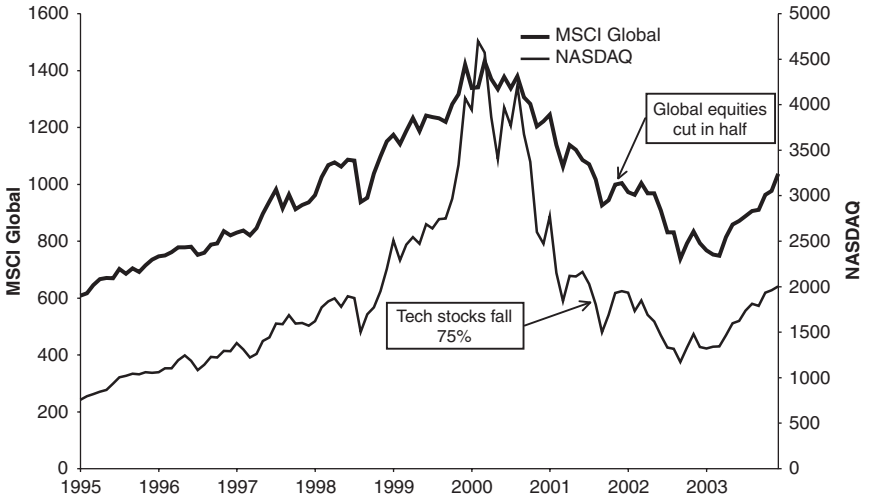

Figure 1.6 MSCI Global and NASDAQ, 1995–2003
SOURCE: Bloomberg.

early 2003. Stocks generally lost half their value while in-vogue technology stocks dropped 75 percent from peak to trough (see Figure 1.6). Just as they had in the 1970s with bonds, real money managers became painfully aware of the equity concentration risk in their portfolios and began to look for a better, less risky approach. Pensions were facing serious underfunding issues and all investors were looking for new answers. Amidst the carnage, the two largest university endowments—Harvard and Yale—rode through the dot-com bust unscathed, causing many investors to explore what these large, sophisticated real money investors were up to (see Table 1.1).

Table 1.1 Equity Returns versus Harvard and Yale Endowments

Fiscal Year (July 1–June 30)	S&P500	MSCI Global	Harvard	Yale
2000	7.3%	11.0%	32.2%	41.0%
2001	−14.8%	−21.3%	−2.7%	9.2%
2002	−18.0%	−16.3%	−0.5%	0.7%
2003	0.3%	−4.1%	12.5%	8.8%

SOURCE: Bloomberg and Mebane Faber, *The Ivy Portfolio* (Wiley).

We Are All Endowments Now

Just as the real money world's attention shifted to the Harvard and Yale Endowments, David Swensen, Chief Investment Officer of the Yale Endowment, published a seminal work in May 2000, entitled *Pioneering Portfolio Management: An Unconventional Approach to Institutional Investment,* in which he outlined his investment process. The book became the bible of the real money world, and dog-eared copies can be found on the desks or bookshelves of most real money managers. Soon after its publication, investors from family offices to pensions and foundations began trying to emulate Yale by creating their own endowment-style portfolios.

The "Yale Model" soon came to be known as the "Endowment Model" as the portfolio management style became pervasive among university endowment portfolios. The Endowment Model, as it was popularly interpreted, is a broadly diversified portfolio, though with a heavy equity orientation, which seeks to earn a premium for taking on illiquidity risk. The argument behind the equity and "equity-like" orientation is that stocks produce the highest returns over time. This fundamental concept has roots in the very foundations of capitalism: risky equity capital should earn more than less risky bonds. The argument for seeking out illiquidity risk comes from financial theory, which states that investors are paid a premium for assuming the risk of illiquid assets (you should be compensated for not being able to sell something when you want). Illiquid investments include publicly traded illiquid securities and a host of "alternatives," including private equity, real estate, venture capital, infrastructure, physical commodities and real assets such as timber, mines, etc. The focus on illiquid assets made the Endowment Model particularly attractive to funds that—at least in theory—had extremely long time horizons, such as endowments and pensions.

David Swensen took over the Yale Endowment in 1985, when total assets stood at $1.3 billion, and started to shift the portfolio towards illiquid alternative assets aggressively after 1990 (see Table 1.2). He grew assets to a reported peak of $22.87 billion by June 30, 2008, a truly remarkable achievement. During his tenure, he shifted Yale's endowment from a classic policy portfolio (80–20 in this case) focused primarily on

Table 1.2 Yale Endowment Portfolio Composition

Asset Class	1985	1990	2008
Domestic equity	61.6%	48.0%	10.1%
Foreign equity	6.3%	15.2%	15.2%
Absolute return	0%	0%	25.1%
Private equity	3.2%	6.7%	20.2%
Real assets	8.5%	8.0%	29.3%
Fixed income	10.3%	21.2%	4.0%
Cash	10.1%	0.9%	−3.9%

SOURCE: Mebane Faber, *The Ivy Portfolio* (Wiley).

listed equities to an illiquid, equity-oriented portfolio invested in a broad array of alternative assets, primarily managed by external managers. His extraordinary performance included only one negative year (–0.2 percent in fiscal 1988), so it is hardly surprising that other investors with similar mandates sought to emulate him.

In the years following the dot-com bust in 2000, and accelerating after 2003, slow-moving investment committees across the real money spectrum shifted their portfolios from the 60–40 model to versions of the Endowment Model, again spurred on by consultants and banks selling both expertise and products. Aggressive real money managers at pension funds and university endowments such as Stanford, Duke, Notre Dame, MIT, and Princeton pushed their portfolios towards high percentages of illiquid assets and alternatives, in turn becoming the industry stars that others sought to emulate. David Swensen followed up his first book with a retail investor version in 2005, entitled *Unconventional Success: A Fundamental Approach to Personal Investment,* in which he addressed how individual investors can mimic the Yale portfolio using low-cost instruments available to retail investors such as Exchange-Traded Funds. Meanwhile, new money management firms headed by former endowment chiefs created endowment-style funds that were sold to retail investors through mass distribution channels.

With so many real money and retail investors piling into the Endowment Model, the assets of partially liquid and illiquid alternative asset managers exploded. Central banks, fighting the last battle—the dot-com bust—kept interest rates low, adding fuel to the fire.

Assets of hedge funds grew from $237 billion in 2000 to over $2 trillion in 2007. Private equity grew from $511 billion with another $450 billion committed in 2003, to $1.5 trillion with another $1 trillion committed in 2008. Investment in commodity indexes grew from $70 billion in 2005 to $180 billion in 2007 and real estate became a worldwide bubble. Yet, as real money investors sought diversification through the same methodology, their portfolios were in fact becoming more correlated to each other while portfolio risks were becoming more concentrated and increasingly dependent upon illiquid equity-like investments. Crowding was becoming an issue, yet the primary concern of real money investors at the time was getting capacity in the "best" managers. This stampede led investors to accept worsening terms, such as longer lockups, less transparency, higher fees, and others that served to increase the overall risk profile of their funds. Indeed, crowding is not a surprise since real money managers often share the same consultants and occasionally the same board members.

In a May 31, 2007 interview in *Fortune*, Harvard's endowment chief at the time, Mohamed El-Erian, was asked about the major investment challenges facing Harvard Management Corporation. He had this to say:

> More people are replicating what we do. The endowment model is very much in vogue. There have been many articles in the press trumpeting how well endowments like Harvard's and Yale's have performed. And David Swensen, who brilliantly heads up Yale's endowment with impressive long-term performance, has written a great book showing how endowment management is done. So now lots of central banks and pension funds are trying to become more like endowments. The space is becoming more crowded.

The Crash of '08

Just as real money investors became fully invested in portfolios resembling the Endowment Model—with hopes of achieving excess returns with low risk—along came the crash of '08, reminding everyone that excess returns are only generated by taking on more risk, even if that risk remains hidden for a period of time. From a peak in October 2007 to a trough in March 2009, global equities declined by almost 60 percent, taking down equity-oriented portfolios with them (see Figure 1.7).

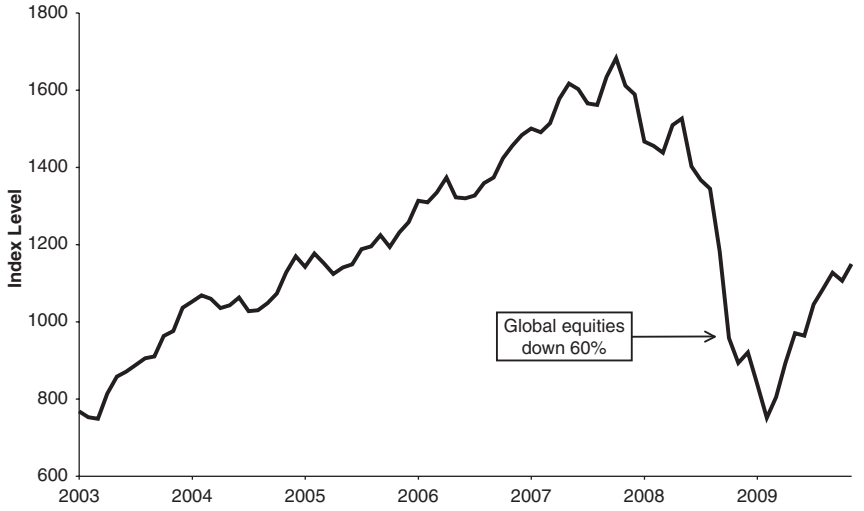

Figure 1.7 MSCI Global, 2003–2009
SOURCE: Bloomberg.

During the fiscal year to June 30, 2009 (which most university endowments report on), the S&P 500 was down 26 percent, while most real money investors suffered losses in the 20 to 40 percent range. Worse, a substantial portion of the remaining assets were illiquid. It was not uncommon to find real money managers stuck in portfolios that were 50 to 100 percent illiquid, making cash obligations difficult to meet. The valuation of illiquid assets is approximate in the best of times, and they could continue to drag down performance for years to come as valuations crystalize. There have been many attempts to sell illiquid assets in secondary markets, and the deals that have been reported were a fraction of the valuations on the books of other portfolios. Some private equity funds have reportedly traded hands for as low as 20 to 30 cents on the dollar.

The crash of '08 highlighted flaws in the Endowment Model, namely: (1) diversification with a high equity orientation is not really diversification; (2) valuation matters, whether it applies to equities, real estate, or liquidity; (3) investing in certain limited partnerships is a form of leverage; and (4) time horizons are not as long as previously envisioned for investors with annual liquidity needs.

First, when you diversify your portfolio but retain an equity and equity-like orientation, you are not really diversified; all the risk eggs

remain in the equity basket. For example, if you are invested in international equities, long/short equity hedge funds with a long bias, private equity, and venture capital, you essentially have a one-way bet on the returns of equities. Similarly, real assets offer equity-like exposure because they are dependent on the nominal growth in the economy. Ironically, the Endowment Model usurped the prevalence of the 60–40 policy portfolio precisely because it was supposed to offer an alternative to equity-centric investing. But not only did the concentration for the Endowment Model remain in equities, it went further, concentrating the equity risk in illiquid investments that were often levered. The asset allocation for Yale in 2008 (see Table 1.2.) had 99.9 percent of the portfolio invested in equity and equity-like assets (4 percent in bonds but –3.9 percent in cash; the portfolio was leveraged outright by 3.9 percent, and presumably the actual leverage was much higher due to committed but yet uncalled allocations to private equity, venture capital, and other funds).

The argument that equities outperform other asset classes in the long term often fails to mention the risk undertaken to achieve that outperformance. Taking risk into account, history offers an alternative answer to the claim that equities always outperform in the long term. Through October 2009, 10-year U.S. government bonds have outperformed the S&P 500 for the past 5 and 10 years. Twenty-year returns of stocks and bonds are almost equivalent, but bonds have less than half the volatility. (See Table 1.3.) Further, from 1900–2000, equities and bonds

Table 1.3 U.S. Equities and U.S. Government Bonds, Annualized Returns and Volatility through October 2009

	Returns		Volatility	
Time Period	**U.S. 10-yr Bonds**	**S&P 500**	**U.S. 10-yr Bonds**	**S&P 500**
5 years	8.08%	–1.12%	7.36%	22.11%
10 years	8.17%	–1.71%	6.81%	20.05%
15 years	8.03%	7.49%	8.52%	21.55%
20 years	7.77%	7.79%	8.48%	19.43%
25 years	8.91%	10.13%	9.50%	18.37%
30 years	9.15%	10.75%	10.04%	17.50%

SOURCE: Bloomberg; and *Damodaran Online,* http://pages.stern.nyu.edu/~adamodar/.

in the United States have generated almost identical nominal returns on a risk-adjusted basis, with bonds slightly outperforming.

Second, 2008 was a reminder that valuation matters. Part of the success of Yale and Harvard could be attributed to their recognition two decades ago that illiquid assets were cheap. As early entrants, they were able to benefit from the increased valuations of illiquids as followers drove up prices. Another part of their success could be a function of the extremely favorable macro environment, which saw declining interest rates and declining inflation for the past three decades. Put another way, it is not at all clear that what transpired will continue to transpire. Sticking to one investment style regardless of valuation or environment is dangerous, but that is exactly what real money managers did.

Third, although real money portfolios do not assume outright leverage, they often attain leverage through allocations to external managers. In this sense, they were implicitly leveraged through their private equity, venture capital, real estate, and other investments that required advanced commitments, giving a portion of their portfolio a short option-like profile. It became common practice for real money managers looking to invest in these areas to "over-commit" by up to two times the target allocation in order to achieve their desired portfolio allocation, as commitments are called. These types of funds draw down (i.e., ask for or "call") the money committed to them as opportunities are identified. As such, only a fraction of a commitment may be used at any one time, and it can take years to fully deploy a commitment. Private equity and venture capital opportunities tend to produce cash flows only after several years because it takes time to generate value and exit the investments. Investors counted on these cash flows from prior investments to fund new capital calls, creating a recycling process. However, in 2008 and 2009, cash flows from successful exits dried up while capital calls continued. This served to increase real money managers' exposure requiring cash precisely when it was in short supply.

For example, on June 15, 2009, CalPERS announced they were raising their investment target to private equity from 10 percent to 14 percent. Of course, their private equity allocation had already risen above their target because of capital calls and the "denominator effect." On June 30, 2009, CalPERS had $21.8 billion of its $180.9 billion portfolio

allocated to private equity, with another $22.5 billion committed—an implicitly levered exposure of 25 percent to private equity.

Fourth, the conventional wisdom that real money managers are "long-term" investors is misguided. Just as all of the equity instruments were correlated on the way up and the way down, so, too, were the illiquid assets. Although the illiquid investments remained illiquid, many formerly liquid investments also became illiquid as real money and levered investors alike all attempted to sell at the same time. Such a worst-case scenario was not considered despite the time-worn adage that liquidity is never there when you need it most. Even if these illiquid assets wind up performing well over time, institutions had short- to medium-term cash obligations that they could not honor due to the illiquid nature of their portfolios, calling into question the true time horizons of these investors.

The difference between the 2000–2003 period—when endowments performed—and the 2008 period—when they didn't—was a function of crowding and the sheer size and percentage of assets dedicated to illiquids and alternatives (often through leverage).

Less Endowed

The large endowments gained a following because of strong performance, but significant losses in 2008 cast doubt upon the quality of that performance. Caught with high proportions of "equity-like" and illiquid investments, they gave back years of gains (see Table 1.4 and Table 1.5). Excess returns require high risks, and the bill finally came due. The majority of Yale's outperformance over the past decade came from private equity and real assets, which currently make up half of the endowment portfolio (see Figure 1.8). It is worth questioning how much of Yale's (and other endowments') past outperformance was attributable to superior manager selection and better portfolio construction, and how much was simply a function of leverage, both explicit and implicit.

Yale University saw its endowment assets fall from almost $23 billion to $16.3 billion for fiscal year 2008–2009, a decline of almost 30 percent. As a result of investment losses and illiquidity, Yale postponed $2 billion in construction projects and trimmed 600 jobs through voluntary resignations and firings. Harvard University saw its endowment assets

Table 1.4 Annual Long-Term Performance of Harvard and Yale Endowments Compared to Other Assets, 1991–2008 (June 30 Fiscal Year End)

1991–2008	Harvard	Yale	S&P500	MSCI World	Barclays AGG	Commodities	HFRI Macro	HFRI FoFs
Return	14.7%	16.0%	9.6%	5.7%	7.1%	3.8%	14.9%	9.4%
Volatility	9.5%	10.0%	15.4%	13.3%	4.6%	14.3%	11.7%	6.8%
Sharpe (5%)	1.06	1.14	0.37	0.11	0.47	−0.02	0.89	0.67
Best Year	32.2%	41.0%	34.7%	22.0%	14.0%	46.6%	44.9%	21.0%
Worst Year	−2.7%	0.7%	−18.0%	−21.3%	−1.3%	−12.0%	4.2%	−0.2%

SOURCE: Mebane Faber, *The Ivy Portfolio* (Wiley), Bloomberg, HFR.

Table 1.5 Annual Long-Term Performance of Harvard and Yale Endowments Compared to Other Assets, 1991–2009 (June 30 Fiscal Year End)

1991–2009	Harvard	Yale	S&P500	MSCI World	Lehman AGG	Commodities	HFRI Macro	HFRI FoFs
Return	11.9%	13.4%	7.3%	3.3%	7.0%	0.3%	14.1%	7.9%
Volatility	13.4%	13.5%	17.2%	15.6%	4.5%	18.1%	11.9%	8.7%
Sharpe (5%)	0.58	0.68	0.22	−0.03	0.47	−0.17	0.81	0.37
Best Year	32.2%	41.0%	34.7%	22.0%	14.0%	46.6%	44.9%	21.0%
Worst Year	−27.3%	−24.6%	−26.2%	−31.2%	−1.3%	−46.0%	−0.2%	−15.2%

SOURCE: Mebane Faber, *The Ivy Portfolio* (Wiley), Bloomberg, HFR.

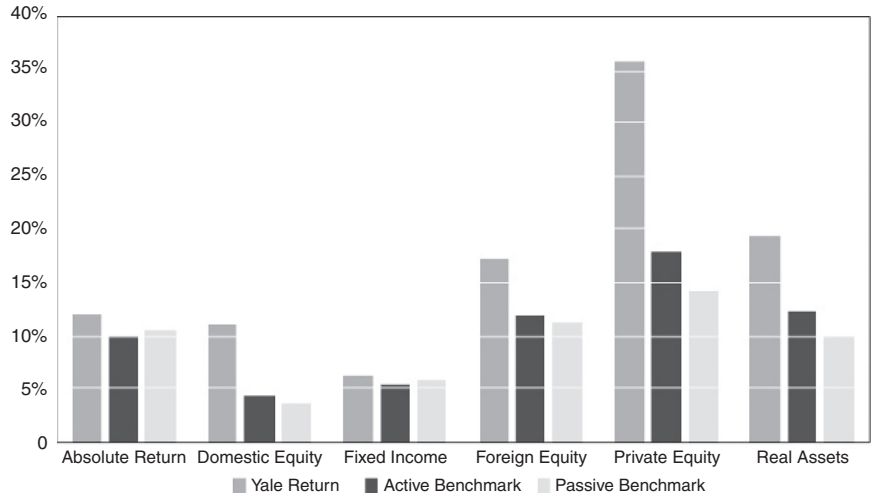

Figure 1.8 Yale Asset Class Results Trounce Benchmarks, 1998–2008
SOURCE: *The Yale Endowment 2008 Investment Report*, http://www.yale.edu/investments/.

decline from a peak of $36.9 billion to $26 billion over the same period, also a decline of almost 30 percent. Similarly, Harvard has frozen teacher salaries, announced layoffs, and curtailed construction projects in the wake of its investment losses and portfolio illiquidity. One of the projects it cancelled was a $1 billion science center across the Charles River on its new Allston campus, a controversial decision that has spurred protests from the local community. On top of these woes, Harvard issued $2.5 billion in bonds to generate additional liquidity, in essence levering up the university, which is now saddled with $5.98 billion in total debt.

After 2008, even David Swensen acknowledged the need to rethink some aspects of his approach. In a May 2009 interview on *Consuelo Mack WealthTrack* (PBS), Swensen remarked, "I'm not sure that the crisis has caused us to conclude that we would do things differently, but it certainly highlighted the importance of liquidity." Yet in the same answer, he added, "One of the things that I've said consistently, and I still continue to believe to be true, is that investors get paid unreasonable amounts for accepting illiquidity in their portfolios."

While that may or may not be true, illiquidity needs to be reconsidered on a risk-adjusted basis, which includes the analysis of stressed scenarios and the impact on the overall portfolio in light of annual cash

liabilities. Although the Endowment Model is not dead, the flaws and shortcomings exposed in 2008 need to be considered and adjusted for when building real money portfolios. Whether the performance of endowment style portfolios snap back quickly or not doesn't matter; we have learned that risk-adjusted returns and drawdowns are important. If large drawdowns force action beyond the portfolio level (i.e., if the underlying institutions must take action because of portfolio losses), then it makes sense to do whatever is necessary to cut off that risk.

Public Pension Goes Endowment

In the fall of 2006, I was invited to attend an offsite meeting for a state pension fund that had just been given clearance, through a November 2006 ballot vote, to invest outside of the United States for the first time. The vote essentially gave them carte blanche to invest in anything. For years, the double-digit billion dollar pension fund had invested half its assets in U.S. listed equities and half in U.S. government bonds. After the vote, the state treasurer wasted no time hiring a CIO from another comparable pension fund, where he had implemented the Endowment Model. The two-day offsite was organized as an opportunity for consultants, product providers, other experts, and constituents to discuss the way forward. Having just published my first book, I was invited to speak about global macro—I did not have an investment product to sell at the time, and was allowed to stay through all of the presentations (most product providers were asked to leave after making their pitch). I saw bond mutual funds, funds of hedge funds, enhanced index products, private equity funds, and others present their wares, all from leading firms. Most importantly, I saw the pension's consultants describe how they were going to convert a pie chart with two slices (stocks and bonds) into one with dozens of slices and a sprinkling of portable alpha (leverage) here and an over-commitment to private equity there. Despite the obvious complications and challenges with transitioning such a large pool of capital, the plan was to execute this major shift in asset allocation as quickly as

possible, through swaps, special purpose vehicles, and block trades. It all sounded so easy. The plan was agreed and initiated during 2007, just in time for the credit crisis. During 2008, the pension's total assets fell by a third and much of the remaining assets are illiquid. Still, despite getting absolutely crushed, they won an industry award for sweeping reform and leading edge design implementation. Meanwhile, had the 2006 vote not passed and the original portfolio remained intact, pension assets would be approximately 20 percent higher today, equating to a few billion dollars.

Pensions Are Different

> Whatever pension-cost surprises are in store for shareholders down the road, these jolts will be surpassed many times over by those experienced by taxpayers. Public pension promises are huge and, in many cases, funding is woefully inadequate. Because the fuse on this time bomb is long, politicians flinch from inflicting tax pain, given that problems will only become apparent long after these officials have departed. Promises involving very early retirement—sometimes to those in their low 40s—and generous cost-of-living adjustments are easy for these officials to make. In a world where people are living longer and inflation is certain, those promises will be anything but easy to keep.
>
> —Warren Buffett, *Berkshire Hathaway 2007 Letter*

While troubles with endowments and universities are worrisome, endowments only represent a little more than $400 billion of capital. Pensions, however, are almost 60 times larger in terms of assets and they more directly impact a wider proportion of society because the taxpayer ultimately foots the bill for their shortcomings. Over the past decade, pension funds piled headlong into the Endowment Model, the ultimate verdict for which is still out; but pensions could wind up being the real losers. For years, demographic challenges have been putting stress on the pension system, and 2008 investment losses exacerbated these issues. According to Watson Wyatt, the 11 largest pension markets saw assets fall by 19 percent in 2008. The consultancy noted a "significant deterioration in

solvency, raising the probability of plan defaults and producing pressures for revised strategies."

CalPERS is emblematic of the broader pension world. For its funding calculations, it has been reporting an expected rate of return of 7.75 percent for the past eight years, and 8.25 percent prior to that. Meanwhile, the actual annualized return over the past decade—from fiscal year 2000 to fiscal year 2009—is only 2.46 percent, and in 2008, it lost over 27 percent. CalPERS, combined with its cross-town rival, CalSTRS (the second largest pension in the United States), had reported peak assets of $436 billion in late 2007, and suffered a peak-to-trough drawdown of $164 billion by early 2009. The California state taxpayer is the backstop.

By way of comparison, when the Orange County pension fund blew up in 1994 amidst great scandal, losses only amounted to $1.64 billion, yet services were cut drastically. Today, California has a budget crisis that has seen state worker furloughs, payments in the form of IOUs, layoffs, and other services cut. California already has the one of the highest state income tax rates in the United States at 10.55 percent, and has been losing businesses and state residents (taxpayers) for years. Not a very solid backstop.

But it is not all dire. Some forward-thinking pension fund managers are asking good questions about the looming issues. At a September 2009 meeting in Sacramento with Joseph Dear, the newly appointed CIO of CalPERS, we discussed the daunting issues facing California pensions. Faced with significant underfunding and demographic challenges, a pension has two options to address the situation: (1) increase contribution levels, reduce benefits, or inject cash from outside sources; and/or (2) improve investment performance. Dear had this to say during our discussion:

> One of the really big questions I am trying to address is how to do asset allocation in this environment because the standard method that we use, that is sold by consultants and is deemed prudent is predicated on a set of assumptions which are empirically false. The whole edifice is built on the assumption that returns are normally distributed and that this is a formula driven exercise whereby returns, volatilities and correlations can be derived by looking at history. As a result, everyone's portfolio ends up looking like everyone else so it is deemed okay if

> you lose money along with everyone else. But it does not adequately address risk. It does not adequately address inter time period funding issues whereby the 20 year horizon may work but you may run out of money in the intermediate period. The main question I am faced with is how to run a large pension fund in light of these issues.

Addressing the "risk" side of the equation head-on is a step in the right direction.

III. RETHINKING REAL MONEY—MACRO PRINCIPLES

One of the main conclusions to come out of this book is that the accepted standard practice of real money no longer works. Real money management needs to be rethought as the old methodologies have failed. The massive growth of real money funds took place in a very benign environment where inflation was falling and virtually all assets performed well. In such conditions, static rule based strategies such as buy and hold, stocks for the long run, and the Endowment Model worked. But in a new, less benign world of higher volatility, a change in standard practice is required.

Despite the widespread pain and colossal losses endured by most investors in 2008, there were a few bright spots. Global macro hedge funds, in aggregate, proved resilient by effectively managing risk and keeping a sharp focus on liquidity. The most successful made substantial gains, in large part due to tactical risk management techniques. In aggregate, global macro hedge funds, as measured by the HFRI Macro Index, returned 4.83 percent in 2008 and were up 4.03 percent for 2009. Since 1990, the HFRI Macro Index has returned an average of approximately 14 percent annually with annualized monthly volatility of 7.8 percent and only one losing calendar year—down 4.3 percent in 1994 (see Figure 1.9).

One of the primary factors enabling global macro funds to exhibit such strong long-term performance is the avoidance of significant drawdowns. Consistently compounding positive returns leads to strong long-term performance, whereas significant, even if infrequent, drawdowns destroy performance. Because of the phenomenon of negative compounding, big losses are very hard to recover from. "Siegel's Paradox"

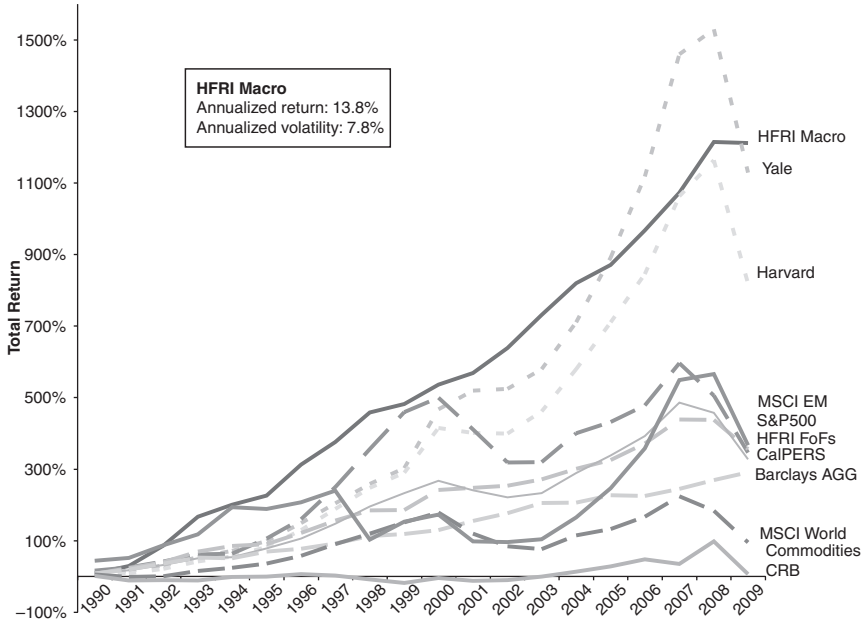

Figure 1.9 Cumulative Returns, 1990–2009
SOURCE: Bloomberg; HFR, *CalPERS Annual Reports*, http://www.calpers.ca.gov/; and Mebane Faber, *The Ivy Portfolio* (Wiley).

explains how gains and losses are not symmetric, losses are much worse. For example, a loss of 50 percent requires a gain of 100 percent just to break even. In other words, the bigger the hole, the harder it is to dig out of (see Table 1.6).

This book offers a contribution towards a new model for real money management leaning heavily on the methods used by many global macro hedge funds and by looking at the lessons learned in 2008. Although I spoke with many real money managers for background on this project, few had the performance in 2008 that would warrant their inclusion. When discussing the concept of this book with a chief investment officer at a billion dollar university endowment, he said:

> Who are you interviewing for the real money part? Most people got smoked—including me—and don't warrant an interview. We should have all just been long 50 percent emerging market equities and 50 percent government bonds for the last 6–7 years and learned to surf.

Table 1.6 Siegel's Paradox

Losses	Returns Needed to Get Back to Even
0%	0%
−10%	11%
−20%	25%
−30%	43%
−40%	67%
−50%	100%
−60%	150%
−70%	233%
−80%	400%
−90%	900%

> Instead, we did all this work to fool ourselves into thinking we found the next best manager since Medallion, and we completely missed out on the macro.

Even Yale endowment chief David Swensen recognized the need to take a more forward-looking, global macro approach. In the May 2009 interview on *Consuelo Mack WealthTrack* (PBS), Swensen said:

> One of the difficulties of this current crisis is that we have to think about securities markets more from a top-down basis or macro basis than is the case when we're not facing the type of crisis we lived through in the past six or nine months or a year. I am religiously bottom up in everything we do . . . but the crisis forces you to think top-down in ways that would, I think, be unproductive in normal circumstances, but are absolutely necessary in the midst of a crisis. You have to think about the functioning of the credit system. You have to think about the potential impact of monetary policy on markets over the next 5 or 10 or 15 years.

The question is: Why wait for a crisis to take a global macro approach when arguably it is already too late? Why not incorporate certain global macro principles into a real money investment approach, melding the best from both worlds? Understanding how global macro managers avoided large losses and made money in 2008 offers a unique opportunity

for new ideas and approaches to be adopted by real money managers and all investors.

The real successes of 2008 occurred when managers took decisive action rather than sat still and hoped that everything would be okay in the long run. The way that global macro managers approach risk distinguishes them from other hedge fund strategies and real money managers. Regardless of valuation metrics or the general attractiveness of an opportunity, a macro manager will always want to know how much he can lose in his portfolio at any given time. The entire portfolio construction process is anchored in risk: What will this specific trade strategy add in terms of overall risk to the portfolio? What are the true risks assumed for each position? In a worst-case scenario, how much can the portfolio or the position lose?

Analyzing the world through a risk prism in no small way enabled macro managers to avoid the pitfalls that befell other investors during 2008. Steadily compounding positive returns while avoiding large drawdowns may sound boring, but it is an effective way to build capital over the long-term. Ironically, conventional wisdom in the investment world holds that global macro hedge funds are risky while real money funds are prudent and safe.

It is now clear that real money managers need to reorient their thought process and approach towards improving the portfolio construction process, especially if they have annual cash needs. Specifically, a more forward looking risk-based approach should be at the foundation of real money portfolios. Real money managers should:

1. **Replace return targets with risk-adjusted return targets.** Big drawdowns and volatility matter. Focusing on return targets misses the damage to performance caused by large drawdowns and high volatility. Portfolios should be constructed such that extreme worst-case scenarios are accounted for and dealt with in the investment process, either through the use of overlays, hedges to cut off tail risk, or less aggressive asset allocation with truly diversifying exposures.
2. **Look forward, not backward.** Historical asset class or fund performance is not a good indicator of the future. Real money portfolios should not be constructed to fit the recent past no matter how comfortable that may be. The macro environment matters greatly

and should be considered first and foremost when constructing portfolios.

3. **Rethink liquidity.** Do not undervalue liquidity when the world looks benign and volatility remains low. Low probability events by definition escape most models, but this does not mean that they should be ignored. On the contrary, it is the fiduciary duty of real money managers to manage to potential scenarios where liquidity can disappear. Similarly, real money managers should not overvalue the return received from taking on illiquidity. Time horizons are much shorter than generally believed.

The following interviews offer a wealth of new ideas and strategies for rethinking real money. While I don't pretend to have all the answers, this book is a good starting point for developing a new model and framework for real money managers.