

Incorporating Distressed Opportunities within a Strategic Asset Allocation Framework

April 2009

WHITE PAPER

Executive Summary

The dramatic meltdowns in equity and credit markets in 2008 have resulted in significant dislocations across all capital markets. While the aftermath of these types of corrections often unveil attractive investment opportunities, we believe institutional investors must exercise caution when seeking to benefit from potential distressed opportunities.

Specifically, two overarching themes require particularly careful consideration: a) how to select distressed opportunities of which to take advantage; and b) how to incorporate these investments into a portfolio to improve its risk/return profile without compromising the current strategic asset allocation.

Our approach, *Incorporating Distressed Opportunities within a Strategic Asset Allocation Framework*, considers these issues and provides a framework for identifying distressed investments, assessing the relative merits of different investments, and effectively incorporating select opportunities into existing portfolios. We examine the concept of distressed opportunities as medium-term opportunities, and discuss why these opportunities may inadvertently fall outside of a strategic asset allocation (SAA) process, or a tactical asset allocation play.

In this white paper, we detail the intellectual rationale for our framework, and discuss how institutional investors can benefit from this approach. The main steps of our framework include:

- Considering an investor's SAA;
- Analysing the role of distressed investment opportunities as part of a medium-term asset allocation (MTAA) which is consistent with a SAA framework;
- Evaluating the distressed investments available, and developing a strategy to assess the relative merits of different types of opportunities; and
- Developing a methodology through which investors can successfully incorporate distressed investments into their portfolios without creating massive strategic disruption to their existing allocations.

Our research shows that rather than increase aggregate risk, carefully constructed allocations to distressed investments can actually reduce volatility and deliver improved potential portfolio returns. Our framework also allows for a dynamic component, enabling investors to calibrate their exposures as the opportunity set for distressed investments plays out over the next one to three years.

Consideration of the Strategic Asset Allocation

Formulating strategic asset allocations (SAA) is of fundamental importance to investors, as numerous studies show that SAA is the primary determinant of performance in diversified portfolios¹. For this reason, adding distressed assets to an existing portfolio requires careful consideration of an investor's SAA.

Most investors have an optimal long-term SAA that seeks to balance the goal of achieving the maximum upside while limiting adverse outcomes in worst-case scenarios. This trade-off can take place in many different guises, and is highly specific to each investor. Even defined-benefit pension funds, using Asset Liability Management to determine their SAA, will have different needs and objectives. For example, one fund may seek to minimize the need to make future increases in contributions, while another may seek to maintain funding levels above a certain level.

In this paper, we assume that an investor's SAA has been constructed based on their specific return objective and risk criterion.

The long-term nature of a SAA has two limiting factors: 1) to construct a SAA, investors use assumptions based on a lengthy forward-looking period and 2) a SAA is not particularly amenable to frequent updating, in other words, it does not lend itself to take advantage of short-term opportunities.

Constructing a SAA requires an investor to make a number of long-term assumptions about expected asset class returns, volatility and macroeconomic data (i.e., interest rates, inflation and economic growth). These assumptions are forward-looking, typically on a basis of 10 or more years. More importantly, the underpinnings of the models used to perform these calculations also tend to rely on the smoothing effects of longer time periods to achieve their equilibrium states.

While the results of a SAA study are dependent on these future long-term assumptions, the portfolio's performance and risk profile are subject to shorter-term movements in asset classes and the prevailing economic environment. This does not present a problem when financial markets and the global economy are experiencing relatively 'stable' conditions. However, a SAA does not take into account periods of extreme market distress that may significantly impact the likelihood of achieving the modeled assumptions over certain time periods.

Investors construct a SAA based on long-term objectives, which means it is not particularly amenable to frequent updating. The frequency of updating is also constrained by the relatively onerous

task of reviewing and amending a SAA; for complex defined benefit pension funds, this can take months. The robustness of a SAA also means that any proposed changes, arising from a review, may only be gradual or incremental over time. After all, large changes would imply a lack of stability in the SAA process, which counteracts its fundamental basis.

These limiting factors present a challenge for investors in times where major market dislocations occur. How does one review a SAA and adjust a portfolio in a timely and efficient manner to profit from opportunities arising from the market dislocation and/or avoid loss caused by the performance of financial markets? This is especially challenging given that such events are outside the standard (tactical) risk budget traditionally included in a SAA.

The role of distressed investment opportunities as part of a medium-term asset allocation to improve portfolio risk/return

Our research has shown that distressed investment opportunities generally have a timeframe of one to three years to be realized (i.e., to generate the most attractive returns). Accordingly, we consider distressed assets to be a medium-term asset allocation play. This is a shorter period than a SAA, which typically operates on a 10-year plus time horizon.

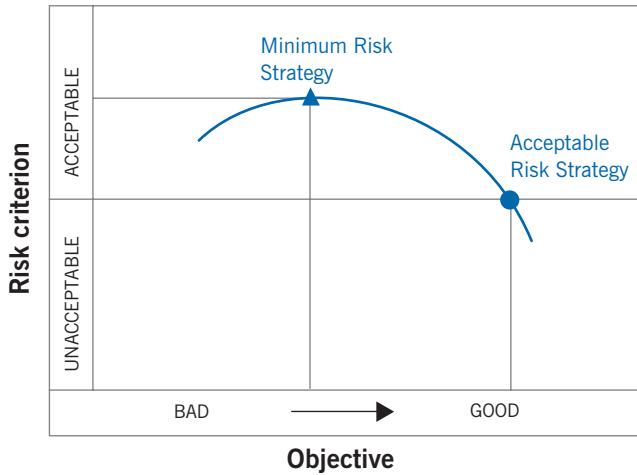
If the SAA represents the optimal objectives of an investor, then possible criteria for the inclusion of distressed assets will depend on the investor's primary needs (as expressed via the SAA). This might be a higher than expected return than the SAA is designed to provide; a lower probability of underfunding; or superior inflation-hedging characteristics. An investor should only deviate from the SAA for one or more of these reasons, depending on which is relevant for the particular investor.

An investor should also consider their risk budget, that is, the excess return per unit of risk that they are prepared to take to invest in an asset class. This is important as the risks associated with distressed assets may exceed an investor's existing risk budget and therefore require an adjustment of the SAA itself.

We can use the asset liability framework in *Display 1* as a starting point from which to assess the impact of adding distressed assets to an existing portfolio. Using an asset liability analysis, appropriate investment strategies will be a minimum risk strategy or an acceptable risk strategy.

¹Brinson, Gary, L. Randolph Hood and Beebower, Gilbert L., 1986, *Financial Analysts Journal*, vol. 42, no. 4 (July/August): 39–48; Brinson, Gary, Brian Singer and Beebower, Gilbert L., 1991, *Financial Analysts Journal*, vol. 47, no. 3 (May/June): 40–48; The Ibbotson and Kaplan study on this subject can be found at http://www.ibbotson.com/download/research/Does_Asset_Allocation_Explains_Performance.pdf Originally published as Ibbotson, Robert and Kaplan, Paul, 2000, *Financial Analysts Journal*, vol. 56, no.1 (January/February): 26–33.

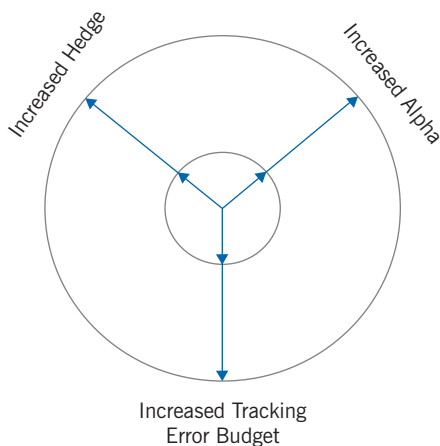
Display 1: An investor may have several appropriate investment strategies



Source: MSIM GPS team. Provided for illustrative purposes only.

In *Display 2*, we illustrate the three main effects that the addition of distressed assets may have on a portfolio—an increase in the portfolio hedging required, increased alpha, and an increase in the tracking error (i.e., the standard deviation of a portfolio’s return relative to a given benchmark). The addition of distressed assets must compensate for any additional tracking error, by either increased alpha potential, an adjustment of the hedging strategy, or a combination of both.

Display 2: The addition of distressed assets may affect a SAA in three ways



Source: MSIM GPS team. Provided for illustrative purposes only. The conclusions are based on the research and opinions of the authors.

So how do we identify those distressed assets whose expected alpha generation or hedging potential are attractive enough to compensate for an increase in tracking error? Further, how do we then assess the impact of adding these distressed assets to a portfolio, in terms of expected return, correlations, and volatility?

We have developed a simple model that investors may use to evaluate distressed investments, and assess the relative merits of different investments. This paper applies our model to a sample European pension fund to demonstrate how investors may successfully incorporate distressed investments into their portfolio in a manner consistent with their SAA.

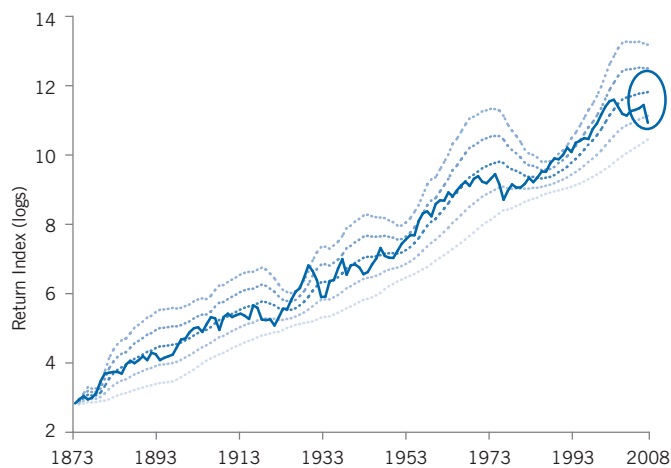
Evaluating and assessing the relative merits of distressed investments

The dislocations experienced in capital markets have resulted in market commentators labelling many asset classes as ‘distressed’. While there is no universal definition of distressed, many investors make a determination based on historical valuation and/or performance data. However, we believe such an assessment ignores the existence of fundamental data (including changing trends and economic conditions) which may prevent an asset class from enjoying the above-normal return potential that distressed opportunities offer. Accordingly, we believe investors should use qualitative and quantitative criteria to ensure a more robust, accurate assessment.

In this section of the paper, we use U.S. equities to illustrate why investors should not rely solely on historical valuation data when evaluating attractive distressed opportunities. We apply three measures—real equity returns, equity trend real prices, and the price-to-earnings (P/E) ratio—which reveal the low valuations and performance reached by this asset class. We then discuss why investors should consider a range of qualitative and quantitative criteria, which, when applied in our example, show that U.S. equities may not be the attractive distressed investment as appears initially.

Our first example considers the performance of U.S. equities from a historical perspective. In *Display 3*, we show annual real returns for the S&P 500 index from 1871 to 2008. Plotting a single linear regression trend line through these returns, we can see that U.S. equities have a long-term annual real return of 6.3%. We also plot one and two standard deviation bands around the trend. As illustrated in *Display 3*, in 2008 U.S. equities delivered returns that were amongst the worst in history.

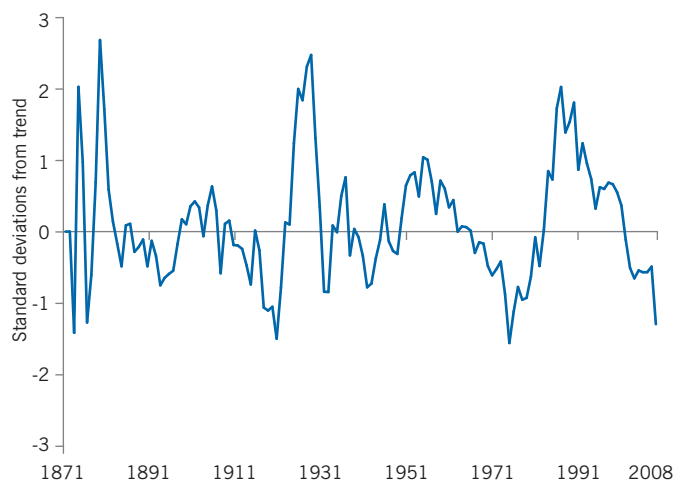
Display 3: U.S. equities appear distressed based on a long-term real return measure



Source: MSIM GPS research; Global Financial Data, Bloomberg. Real annual total returns have been deflated using U.S. CPI data. Data as at 31 December, 2008. Past performance is not indicative of future results.

Display 4 shows the deviation from the long-term trend as defined by the regression in *Display 3*. Based on a real equity-price measure, the S&P index has reached relatively low levels.

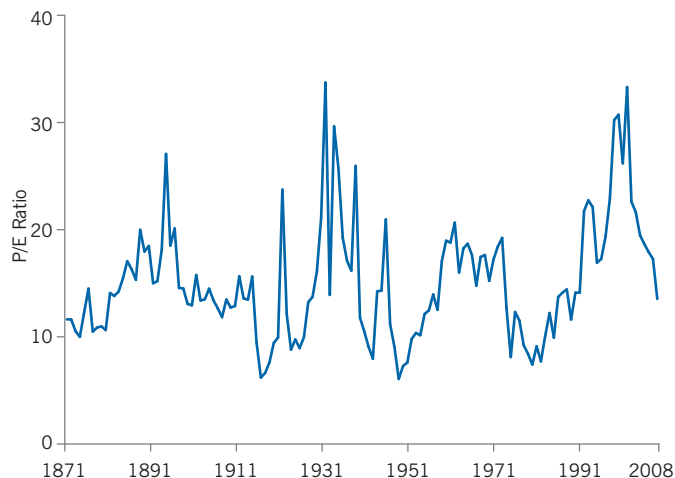
Display 4: U.S. equities appear distressed based on a real equity price measure



Source: MSIM GPS research; Global Financial Data, Bloomberg. Annual real total returns have been deflated using U.S. CPI data. Data as at 31 December, 2008.

In *Display 5*, we plot the trailing 12 month P/E ratio of the S&P 500 index from 1871 to 2008. At the end of 2008, the P/E ratio for U.S. equities was approaching historically low levels.

Display 5: U.S. equities are approaching historically low valuation levels based on a P/E ratio measure



Source: MSIM GPS research; Global Financial Data, Bloomberg. Real total returns are annualized and have been deflated using US CPI data. Data as at 31 December, 2008.

We can see that, based on the three historical measures, the U.S. equity market is reaching historical lows from a performance and valuation perspective. However, this does not necessarily make this asset class distressed as it ignores fundamental data (including changing trends and economic conditions) which may prevent U.S. equities returning above-normal returns. Instead, we believe investors must use a comprehensive framework—incorporating quantitative and qualitative criteria—which considers the impact of fundamental data.

Our framework consists of a simple model (based on qualitative criteria) and a quantitative-analytical process. Investors can use it to assess a) whether an asset class is distressed, and b) its relative attractiveness, and select an appropriate investment(s) based on their individual objectives (as expressed via their SAA). An investor may easily, and quickly, apply this framework at any point in time, to position their portfolio in an attempt to realize the most attractive returns. This is important because the universe of distressed opportunities is a continually evolving one, with the opportunity set able to change significantly throughout a relatively short time-period.

We have constructed our framework based on a common premise—that in order to be distressed, an investment must offer above-normal return potential as compared to the return potential of “normal/steady” markets. To assess this return potential and to evaluate the relative attractiveness of the opportunities, we have devised five criteria in our qualitative model: model-ability; historic metrics; presence of secular trends; return timeframe; and economic factor prospects (*Display 6*).

Display 6: A framework for assessing distressed opportunities

	Global Gov't Bonds	Global Inv Grade Credit	Global HY Bonds	U.S. Senior Loans	EM External Debt	Commodities	Private Equity	Euro Real Estate	Global Equities
Model-ability	+	++	++	++	+	0	-	0	-
Historical Position	-	++	++	++	+	0	+	++	+
Secular Trend Break	No	Minor	Minor	Minor	Adjustment	Deflating bubble	No	No	No
Time Horizon (Workout)	N/A	2-3 Years	1-2 Years	1-2 Years	2-3 Years	N/A	7 Years	5 Years	3 Years
Economic Factor Prospects	0	+	+	++	-	-	0	+	0
	++ - Excellent	+ - Good	0 - Average	-- - Poor					

Source: MSIM GPS research. The data in the table reflects the team's assessment based on the macroeconomic and market data existing as of 28 February 2009. The chart above is provided for illustrative purposes only and is not intended to predict the performance of any Morgan Stanley or other investment. There is no guarantee that any of the asset classes described above will produce positive investment performance in the future.

The first criterion we use is “model-ability,” which refers to the extent to which the asset class can be modeled based on observable characteristics. For example, data on credit spreads, default rates and recovery rates make the credit space reasonably amenable to modeling. Conversely, the opacity of private equity as well as its multifaceted, diverse nature makes it far more difficult, if not impossible, to model. The ability to model an asset class is important in portfolio construction, as it more easily allows a quantitative evaluation of the impact of the investment to the investor's personal objective and risk criterion.

The second criterion is the current position of an asset class relative to its history, ranked on price and other measures, such as valuation. Historical extremes can point to greater levels of distress or distortion than otherwise might be ascribed to an asset class. Being able to do cross-sectional comparisons is vital to discriminating between opportunities.

Our third criterion considers the need to look outside of an asset class and examine what is happening more broadly at a macro and microeconomic level. If there is a secular trend break due to changing fundamentals (e.g., regulations, supply and demand), then what may have been considered distressed previously might no longer offer above-normal return potential. For example, we believe global investment grade credit will experience a minor secular trend break due to the increased compensation an investor will require for assuming a certain level of risk. Yet, we do not think this is significant enough to affect its above-normal return potential. However, we believe emerging markets debt will experience an adjustment requiring investors to price in more government and political risk in the future. In our view, this affects the asset class's ability to offer above-normal return potential.

The fourth criterion is timeframe. That is, we must assess the timeframe over which an investor might realize an above-normal return for a particular asset class.

Lastly, we examine the economic factor prospects of an asset class to assess its above-normal return potential. By this, we mean the potential of the assets to perform under various economic conditions (including GDP growth/recession and high and low inflation scenarios). It is important to use the conditions most likely to exist in the next two to three years. In our view, these conditions include higher than average levels of market volatility, lower inflation, negative/minimal GDP growth, and tightened correlations of most asset classes (above long-term average trends). After a four-year distressed period, we then forecast a more stable economic climate, with moderate inflation and moderate-to-low growth. Based on these assumptions, we consider equities less attractive than other distressed asset classes as they may deliver low returns due to the weak economic growth forecast during the next two years.

The second part of our framework involves a quantitative analysis of expected returns based on anticipated recovery time horizons and macroeconomic conditions. This data is also important when modeling the impact of adding certain distressed assets to an existing portfolio.

To calculate expected returns, we require a model that is flexible enough to represent the economic climate we expect during a four-year recovery horizon for distressed assets. We have used a proprietary model, the Long Term Asset Return Model (LTARM), to calculate the excess expected returns — that is, returns greater than the expected long-term return assumptions — for the distressed asset categories for the next few years (*Display 7*). Our results show that real estate, and some of the credit related asset categories, such as senior loans and investment grade credit, offer significant excess return potential compared to expected long-term return assumptions.

The Long Term Asset Return Model (LTARM)

LTARM generates future distributions of relevant economic variables, such as returns, GDP growth and inflation. The model is based on simulation of multivariate lognormal distributions for the variables involved, and is integrated with a term structure based yield curve model.

Using LTARM, we can calculate long-term equilibriums, as well as volatilities and interdependencies, for the macro-economic variables associated with a certain economic climate—such as “deflationary” or “low growth”. This is done by filtering past monthly data to reflect periods that we think are most relevant for a certain economic climate. We then simulate economic scenarios and use a proprietary Stochastic Risk Premium Model to calculate the implied internal rate of excess returns based on that economic climate.

By using a dynamic fill-in for the underlying macro-economic variables for the next four years to reflect the current “distressed” environment, we can create simulated return paths that represent the “road to recovery” behavior of the distressed asset categories.

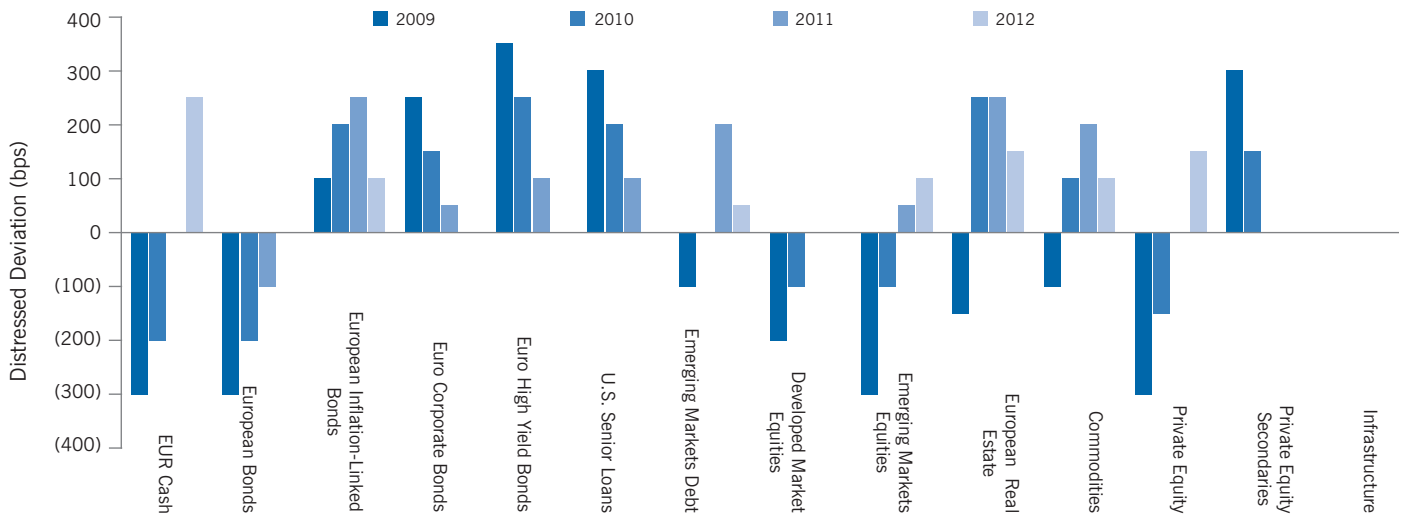
From our framework, we can draw some general conclusions as to the overall attractiveness of different asset classes. An initial review reveals that, based on the qualitative model and quantitative analysis, U.S. senior loans, global high yield bonds and European real estate rank as very attractive distressed investments. However, if an investor’s existing portfolio is overweight assets that are closely correlated with the performance of European real estate, then European real estate will not be attractive for them despite the fact it might be considered distressed. Similarly, if an investor’s objective is concerned with duration gap management, then the duration of otherwise “attractive” distressed assets may render them extremely unattractive.

Case Study:¹ Incorporating distressed investments into an existing SAA framework

Once an investor has determined the most attractive opportunity(ies) based on their individual objectives, how do they incorporate these assets into an existing portfolio?

An investor must evaluate any changes to the risk budget—resulting from asset-allocation shifts—at the strategic level. The size of an investor’s risk budget will affect the type of distressed asset an investor can invest in and in what proportion.

Display 7: Forecast annual excess return potential compared to expected long-term returns



Source: MSIM GPS research. Data calculated as at 28 February 2009. Past performance is no guarantee of future results. The expected returns are provided by way of example only. There can be no assurance that expected returns can be realized or that actual returns or performance results will not be materially lower than those estimated herein. The expected returns do not reflect the performance of any Morgan Stanley investment. They are based on the research, analysis and opinions of the investment team and on Morgan Stanley’s propriety models and various assumptions, and any changes to such models and assumptions could have a material impact on the returns set forth herein.

¹This case study is being provided for informational purposes only. It is not a solicitation, or an offer to buy or sell any security or investment product. It does not contend to address the financial objectives, situation or specific needs of any individual investor. Past performance is no guarantee of future results. It is not intended to predict the performance of any Morgan Stanley or other investment. There is no guarantee that any of the asset classes described herein will produce positive investment performance in the future.

Using a sample European defined-benefit pension plan, we demonstrate how distressed assets can be incorporated to improve a portfolio’s risk/return profile without causing significant disruption to the existing SAA.

The initial asset allocation for the plan is set out in *Display 8*.

Display 8: Existing asset allocation for a sample European Pension Plan

Asset Class	Weight (%)
EUR Cash	5.0
European Bonds	50.0
European Equities	25.0
World ex-Europe Equities	20.0
European Property	0.0
Senior Loans	0.0
Euro Corporate Bonds	0.0

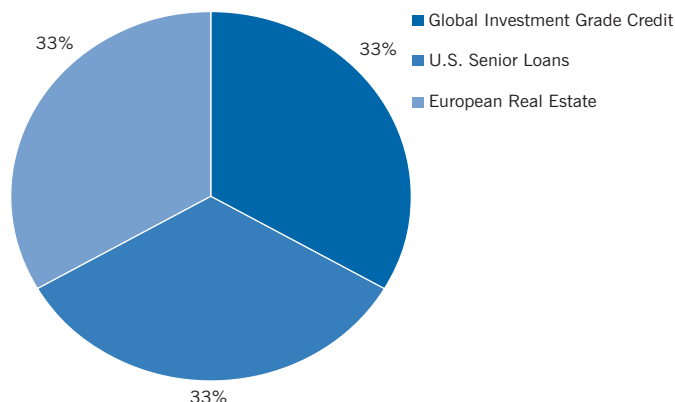
Provided for illustrative purposes only.

We assume that the pension fund’s objective is to maximize the expected funding level and that the risk criterion is to minimize the plan’s liability tracking error. We also assume a duration of 20 years for the plan liabilities, with a starting funding level of 70%.

Using the framework we presented earlier for determining the relative attractiveness of distressed investments, we have created a simple three-asset distressed portfolio consisting of European real estate, U.S. senior loans and global investment grade credit (*Display 9*). We have designed this distressed portfolio as an addition to the existing portfolio.

For the sake of simplicity, we have equal-weighted the assets rather than optimized their weighting. We have selected these assets as they are attractive (based on our five-criterion framework); do not currently exist in the portfolio; and offer a positive duration with the liabilities of our sample European pension fund.

Display 9: The proposed distressed asset portfolio



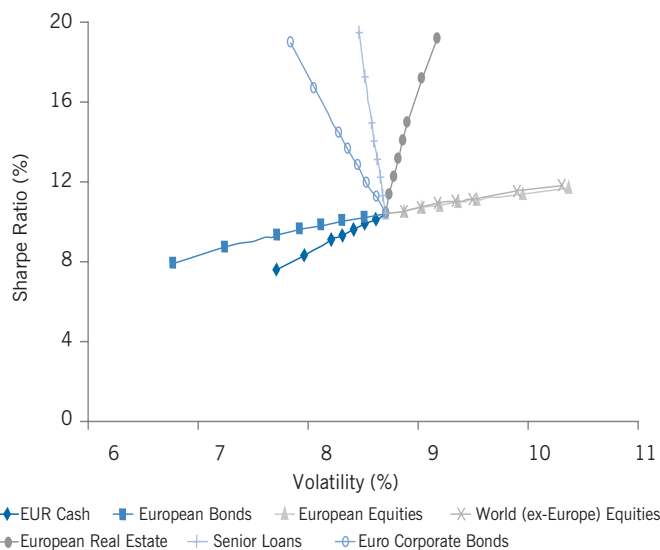
Source: MSIM GPS research. Provided for illustrative purposes only.

In this case study, we consider the effect of adding the distressed asset portfolio and evaluate the impact on the pension fund’s objective and risk criterion.

In *Display 10*, we model the effect, in terms of Sharpe ratio and volatility, of adding both distressed and non-distressed asset classes to the portfolio. The center point of the diagram where the lines converge represents the existing portfolio. Each line radiating from this center represents an increase in the respective asset by 1%, up to 10%.

Display 10 shows that the addition of any of the three distressed assets to the existing portfolio would improve the Sharpe ratio and, in most cases, reduce portfolio volatility. However, the addition of the non-distressed asset classes causes little change to the Sharpe ratio, and, in the case of European and global equities, actually increases portfolio volatility.

Display 10: The addition of distressed assets improves the portfolio’s Sharpe ratio



Source: MSIM GPS research. Past performance is no guarantee of future results. The figures are provided by way of example only. There can be no assurance that returns can be realized or that actual returns or performance results will not be materially lower than those estimated herein. The figures do not reflect the performance of any Morgan Stanley investment. They are based on the research, analysis and opinions of the investment team and on Morgan Stanley’s proprietary models and various assumptions, and any changes to such models and assumptions could have a material impact on the returns set forth herein.

Display 11: The addition of distressed assets improves the portfolio's value-at-risk

Expected Value-at-Risk relative to target r at confidence level c , as percentage of invested capital

Asset Mix	1 Year Horizon			2 Year Horizon			3 Year Horizon		
	$c = 90\%$, $r = 0\%$	$c = 95\%$, $r = 0\%$	$c = 99\%$, $r = 0\%$	$c = 90\%$, $r = 0\%$	$c = 95\%$, $r = 0\%$	$c = 99\%$, $r = 0\%$	$c = 90\%$, $r = 0\%$	$c = 95\%$, $r = 0\%$	$c = 99\%$, $r = 0\%$
Sample European Pension Fund (SEPF)	6.5%	9.3%	14.2%	7.0%	10.9%	17.7%	6.6%	11.3%	19.5%
SEPF+10% Distressed	5.5%	8.2%	13.0%	5.3%	9.1%	15.7%	4.2%	8.8%	16.9%
SEPF+20% Distressed	4.1%	6.5%	10.8%	3.2%	6.5%	12.6%	1.4%	5.5%	12.9%
SEPF+30% Distressed	2.6%	4.7%	8.4%	1.0%	3.9%	9.1%	0.0%	2.2%	8.7%
SEPF+40% Distressed	1.5%	3.3%	6.6%	0.0%	1.9%	6.6%	0.0%	0.0%	5.4%

Source: MSIM GPS research. Past performance is no guarantee of future results. The figures are provided by way of example only. There can be no assurance that returns can be realized or that actual returns or performance results will not be materially lower than those estimated herein. The figures do not reflect the performance of any Morgan Stanley investment. They are based on the research, analysis and opinions of the investment team and on Morgan Stanley's propriety models and various assumptions, and any changes to such models and assumptions could have a material impact on the returns set forth herein.

In *Display 11* and *12*, we illustrate the impact on the portfolio's asset risk measures caused by adding varying quantities of the distressed portfolio. In *Display 11*, we highlight the improved portfolio value-at-risk, while *Display 12* shows the improvement in the portfolio's shortfall risks.

Display 12: The addition of distressed assets improves shortfall risks

Expected Shortfall Risks

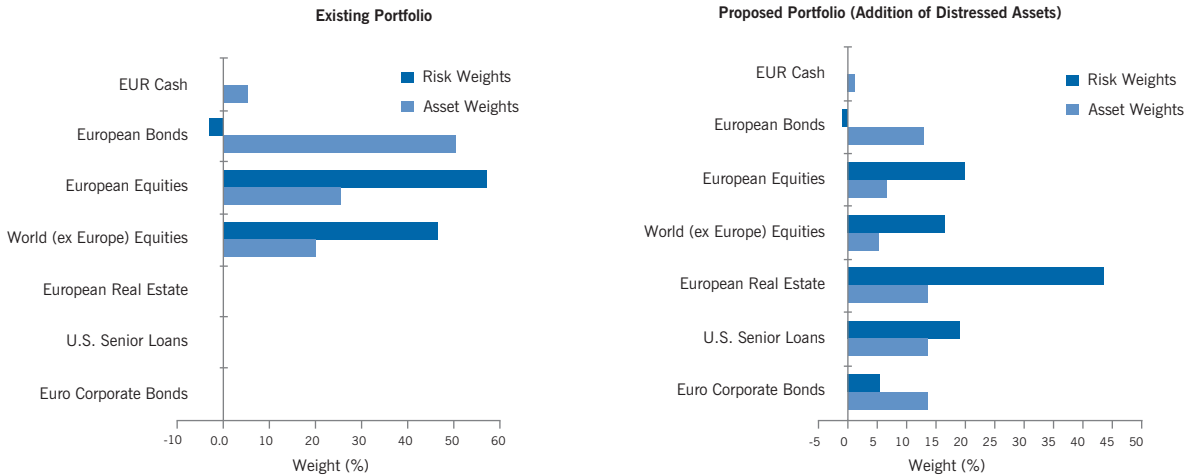
Asset Mix	1 Year Horizon			2 Year Horizon			3 Year Horizon		
	$r < -10\%$	$r < -5\%$	$r < 0\%$	$r < -10\%$	$r < -5\%$	$r < 0\%$	$r < -10\%$	$r < -5\%$	$r < 0\%$
Sample European Pension Fund (SEPF)	4.1%	13.8%	32.1%	0.7%	6.2%	25.5%	0.1%	3.0%	21.0%
SEPF+10% Distressed	2.9%	11.3%	28.8%	0.4%	4.3%	21.4%	0.1%	1.8%	16.6%
SEPF+20% Distressed	1.4%	7.8%	25.0%	0.1%	2.3%	17.0%	0.0%	0.7%	12.1%
SEPF+30% Distressed	0.4%	4.4%	20.5%	0.0%	0.8%	12.2%	0.0%	0.2%	7.7%
SEPF+40% Distressed	0.1%	2.4%	16.4%	0.0%	0.2%	8.4%	0.0%	0.0%	4.5%

r = Return

Source: MSIM GPS research. Past performance is no guarantee of future results. The figures are provided by way of example only. There can be no assurance that returns can be realized or that actual returns or performance results will not be materially lower than those estimated herein. The figures do not reflect the performance of any Morgan Stanley investment. They are based on the research, analysis and opinions of the investment team and on Morgan Stanley's propriety models and various assumptions, and any changes to such models and assumptions could have a material impact on the returns set forth herein.

We also see a marked decrease in the concentration of risk weights after moving 40% of the portfolio into distressed assets (*Display 13*).

Display 13: The addition of distressed assets improves the portfolio's risk weight concentrations

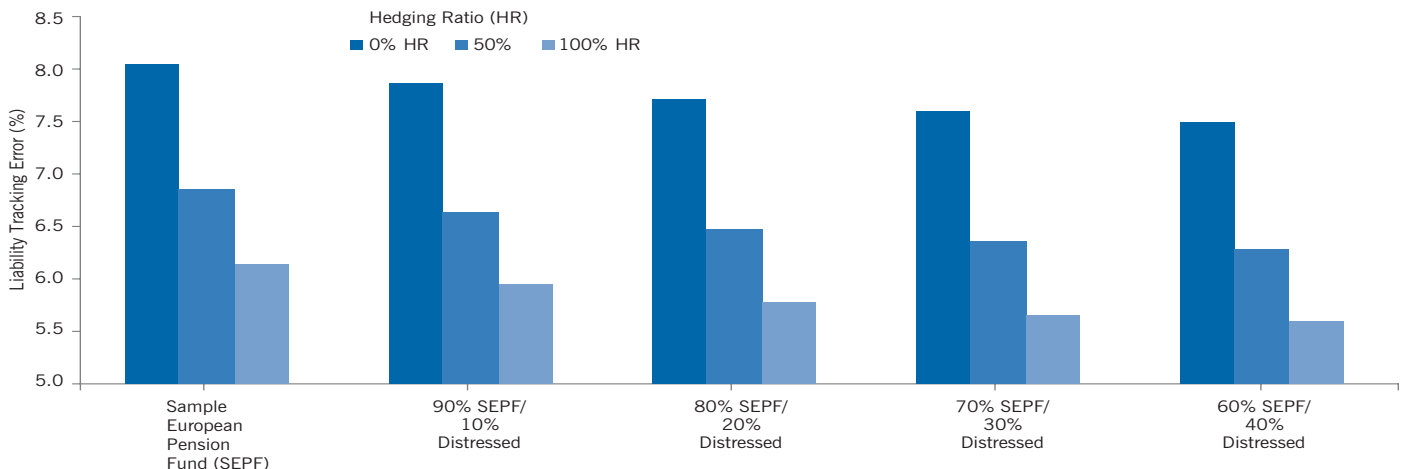


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To assess the impact of adding distressed assets on the pension fund's risk criterion, we use the Liability Tracking Error (LTE). The LTE is the volatility of assets relative to liabilities, and is a key measure for many defined benefit pension schemes. In *Display 14*, we model the impact on the fund's risk criterion based on movements to the portfolio's LTE as well as the impact of additional interest rate hedging of the fund's liabilities (as measured by the Hedge Ratio).

As shown in *Display 14*, the LTE of the portfolio decreases as the proportion of distressed assets increases. This decrease means we do not need to increase the risk budget constraint of the SAA. However, this will not always be the case, as a different distressed portfolio could have increased the LTE, in turn requiring an increased risk budget. *Display 14* also demonstrates that rather than necessitating an increase in interest rate hedging, the addition of distressed assets actually reduces the hedging required.

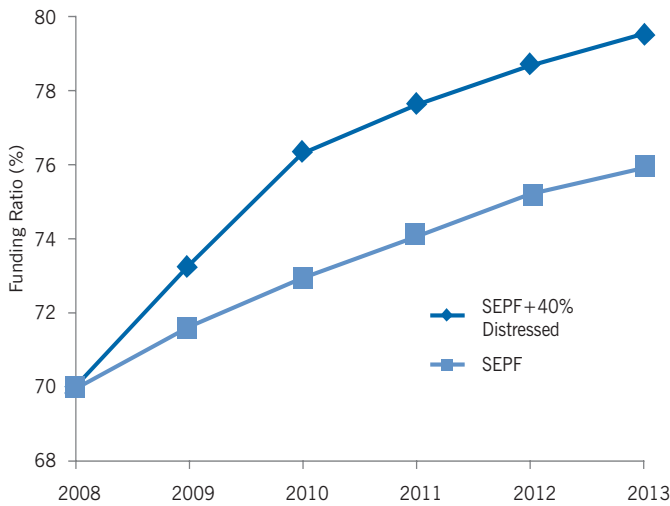
Display 14: Distressed assets reduce the portfolio's liability tracking error



Source: MSIM GPS research. Past performance is no guarantee of future results. The figures are provided by way of example only. There can be no assurance that returns can be realized or that actual returns or performance results will not be materially lower than those estimated herein. The figures do not reflect the performance of any Morgan Stanley investment. They are based on the research, analysis and opinions of the investment team and on Morgan Stanley's propriety models and various assumptions, and any changes to such models and assumptions could have a material impact on the returns set forth herein.

Finally, we consider the impact that our proposed distressed portfolio has on the pension fund's objective: to maximize the expected funding level. As *Display 15* shows, there is a strong improvement on the existing funding levels in the first three years, followed by an incremental difference after that. This is consistent with the time horizon for the realization of the combination of the three distressed assets selected, and the normalization of asset behavior thereafter.

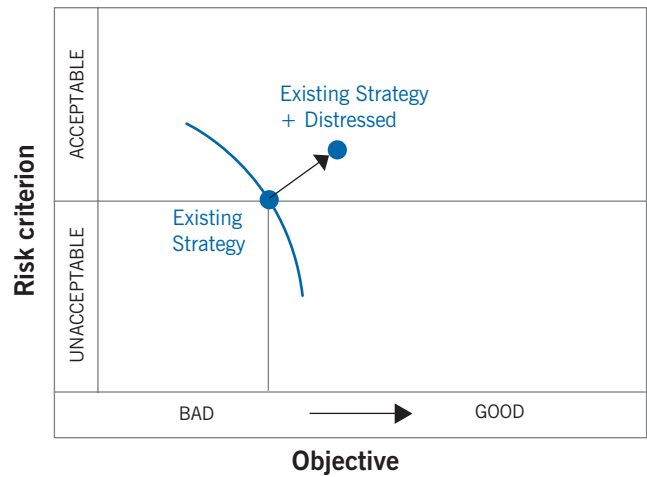
Display 15: Distressed assets improve the portfolio's funding ratio



Source: MSIM GPS research. Past performance is no guarantee of future results. The figures are provided by way of example only. There can be no assurance that returns can be realized or that actual returns or performance results will not be materially lower than those estimated herein. The figures do not reflect the performance of any Morgan Stanley investment. They are based on the research, analysis and opinions of the investment team and on Morgan Stanley's proprietary models and various assumptions, and any changes to such models and assumptions could have a material impact on the returns set forth herein.

In summary, the impact of adding the distressed portfolio is positive for both the risk criterion and the pension fund's objective, and improves a number of the portfolio's risk measures. If we refer back to *Display 1*, this means that an investor can improve on the characteristics of the existing strategy (the Acceptable Risk Strategy). *Display 16* illustrates the benefits of adding distressed assets to the pension fund's strategy (comprising the objective and risk criterion).

Display 16: Impact of distressed assets on the SAA



Provided for illustrative purposes only.

In this paper, we have not considered the practicalities associated with the actual implementation of a distressed portfolio. However, investors should be aware that the addition of distressed assets to an existing portfolio raises issues, such as the management of liquidity in a distressed portfolio. It is also crucial to have a strong and flexible risk-management framework to monitor and keep oversight of the portfolio.

Conclusion

While it is clear that the recent dislocations in capital markets may present attractive investment opportunities, the evaluation and assessment of these opportunities is not straightforward. We believe that investors must carefully consider how they assess and select distressed opportunities, and incorporate these investments into an existing portfolio in a timely and efficient manner.

Our framework provides a basis for identifying distressed opportunities, assessing the relative merits of different investments, and successfully incorporating these investments into an existing portfolio without causing disruption to an existing strategic asset allocation.

Through our case study, we demonstrate that a carefully constructed distressed portfolio can have a positive impact on both the objective and the risk criterion of a pension fund. Further, we illustrate that the addition of a distressed portfolio can actually reduce risk, potentially allowing an investor to re-allocate part of their risk budget to pursue a more aggressive strategy.

Morgan Stanley Investment Management Publications

Following are recent thought-leadership papers covering a range of investment issues:

Finding Opportunities in Senior Loans Amid Increased Volatility

March 2009—The continuing market volatility undoubtedly represents a challenge to investors—but it has opened up substantial opportunities as well. One such opportunity, in our view, is the senior loan market. In this paper, MSIM's Senior Loans Team's Kevin Egan and Gregory Olsen provide an update on their report from last fall, *Finding Opportunities in Senior Loans Amid Increased Volatility*, that reflects their latest thinking amid the rapidly evolving events in the markets.

Navigating the Recession: Identifying Tactical Opportunities amid the Slowdown

February 2009—In the wake of recent asset price declines, investors are seeking options for rebalancing their allocations and deploying capital in the coming months. This paper provides a macro-economic view of the markets through the eyes of three senior portfolio managers. It also looks at some of the underlying fundamentals from both a current and historical perspective, and drills down on select themes that investors should consider over an intermediate-term time horizon.

The Infrastructure Opportunity: Repair, Build and Stimulate

February 2009—As the world grapples with a severe economic slowdown, government spending on infrastructure appears on the rise, creating opportunities. Our analysis suggests that a total \$41 trillion will be needed by 2030 to build and repair infrastructure globally, a level of spending that, in our view, creates an attractive secular case for investing in infrastructure.

Portfolio Choices for Oil Based Sovereign Wealth Funds

January 2009—Financial management of resources generated by oil sales has gained momentum recently in light of the growing endowment of oil-rich countries' sovereign wealth funds (SWF). This paper outlines a framework investors can use to address some of these issues, proposing that the optimal asset allocation for a SWF should take into consideration both speculative and hedging demand

Portfolio Liquidity

January 2009—The deterioration in asset values during 2008 unveiled a host of new liquidity problems for many diversified portfolios. Portfolio managers need cash-like assets to fulfill immediate funding requirements, yet they must also maintain low concentrations of illiquid assets in their portfolios, sustain returns, and preserve beta sensitivity. In this paper, we set forth a basic framework for addressing the highly complex liquidity problem.

Global Recovery Post Bubble

January 2009—While the worst of the global downturn may run its course by late 2009, the risk is that any rebound in 2010 will be anemic and fragile. In this article, Stephen Roach, Chairman of Morgan Stanley Asia, shares his views on the striking asymmetry of economic forces leading up to a global rebalancing.

An Opportunistic Approach to Hedge Fund Investing In the New Market Landscape

January 2009—In this paper, we examine some of the primary causes of the industry's recent underperformance for hedge fund managers. We also look at a likely consequence of the growing pressure on managers—a consolidation that will put a premium on large, diversified hedge fund providers with institutional-quality operations. Within this context, we identify several market dislocations and distressed pricing opportunities that we believe hedge funds are well positioned to exploit.

Private Equity Outlook: Evaluating Opportunities and Allocations amid the Credit Crunch

January 2009—While private equity is not impervious to the volatility inherent in the economic and business cycles, we anticipate that compelling investment opportunities will continue to surface. Our research shows that these opportunities will be characterized by attractive valuations and conservative leverage, and entail the acquisition of businesses that can be enhanced through operational/strategic changes and operate in niche markets. In the current environment, we believe that the middle market is more likely to offer prospects of this nature than the mega leveraged-buyout arena.

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Contact us

Joseph McDonnell

Head of Global Portfolio Solutions EMEA & Asia

Managing Director

+44 20 7425-6178

joseph.mcdonnell@morganstanley.com

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