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Art, science, and unmeasurable risk

Three observations on liquidity and volatility

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BAI ALTERNATIVE INVESTOR CONFERENCE MARCH 2008

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iTraxx IG index

The iTraxx Investment Grade five year index which tracks credit default risk on 125 investment credits has widened from 26 basis points to 153 basis points or almost 500% since June 2007. More than two-thirds of the move occurred in 2008.

June 2007	26 basis points
November 2007	52 basis points
January 2008	79 basis points
February 13th	110 basis points
March 7th	153 basis points

Current levels imply a default rate of over 10%. The ten year index, currently trading at 155 basis points, implies a default rate of greater than 20%.

The average annual historical default rates for a group of cohort credits are 1.3% and 3.1% respectively. The five and ten year cumulative defaults rates are 4.6% and 8.1%, respectively.

The iTraxx Investment Grade five year index implies a default rate of over 10% against cumulative realized historical defaults of 4.6%

Janet Yellen

San Francisco Federal Reserve Bank President, Janet Yellen gave a speech late last month where she made the following statement:

> "…many markets for securitized assets, especially non-agency mortgage-backed securities, continue to suffer severe illiquidity; in other words, the markets are not functioning efficiently, or may not be functioning at all."

The US mortgage-backed encompasses $11 trillion of assets.

The AAA non-agency segment of that market repriced down 20-30% since the beginning of the year. Current coupon agency paper is trading at the widest spreads (256 basis points) to US Treasuries since 1986.

Federal Reserve Bank President states "many markets for securitized assets… may not be functioning at all"

Repo financing haircuts

Haircuts on repo financing have more than doubled over the past few months. In the last seven trading days, the RMBS market has seen a multitude of bid-wanted-in-competition lists including:

Carlyle Capital	$22 billion
UBS	20 billion
Peloton	9 billion
Thornburg	5 billion

One bond analyst calculated that the $11 trillion mortgage-backed securities market requires $1 trillion in new capital to fund the 50% reduction in financing available to RMBS since the beginning of the year.

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What do these three observations imply?

We are experiencing a liquidity event.

A liquidity event is a time in markets when there is a disruption in the normal, continuous making of prices by market makers. It is called a “liquidity” event because those market makers who normally provide liquidity stand back and do not make prices nor provide capital.

This results in very wide bid-ask spreads from the remaining marginal market makers which, in turn, creates price functions that look like step functions rather than continuous functions.

During liquidity events, the lack of liquidity makes it difficult or impossible for information to become embedded in prices.

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Why did so many not see this coming?

Frank H. Knight, the original founder of the "Chicago School" of economics, in his 1921 classic, *Risk, Uncertainty, and Profit*, made the following distinction:

> The key to the whole tangle will be found to lie in the notion of risk or uncertainty and the ambiguities concealed therein…
>
> Uncertainty must be taken in a sense radically distinct from the familiar notion of risk… It will appear that a *measurable* uncertainty, or "risk" proper, is very different from an *unmeasurable* uncertainty…
>
> We shall accordingly restrict the term "uncertainty" to cases of the non-quantitative type.

A measurable *uncertainty, or "risk" proper, is very different from an* unmeasurable *uncertainty*

Liquidity events as unmeasurable uncertainties

The causes of liquidity events are never the same – therefore, they defy forecasting and are extremely difficult, if not impossible to risk-manage.

In some cases, liquidity events are caused by the sudden realization by market makers that they are holding the same risk that is rapidly repricing – such as the Russian/LTCM crisis of the fall of 1998.

In other cases, they are caused by a temporary disruption of market infrastructure – such as September 11th, 2001.

In still other cases, they are caused because what was previously thought to be accurate information is suddenly deemed inaccurate information – such as the accounting scandals of Enron and World Com in the summer of 2002.

The causes of liquidity events are never the same – therefore they are difficult, if not impossible, to risk-manage

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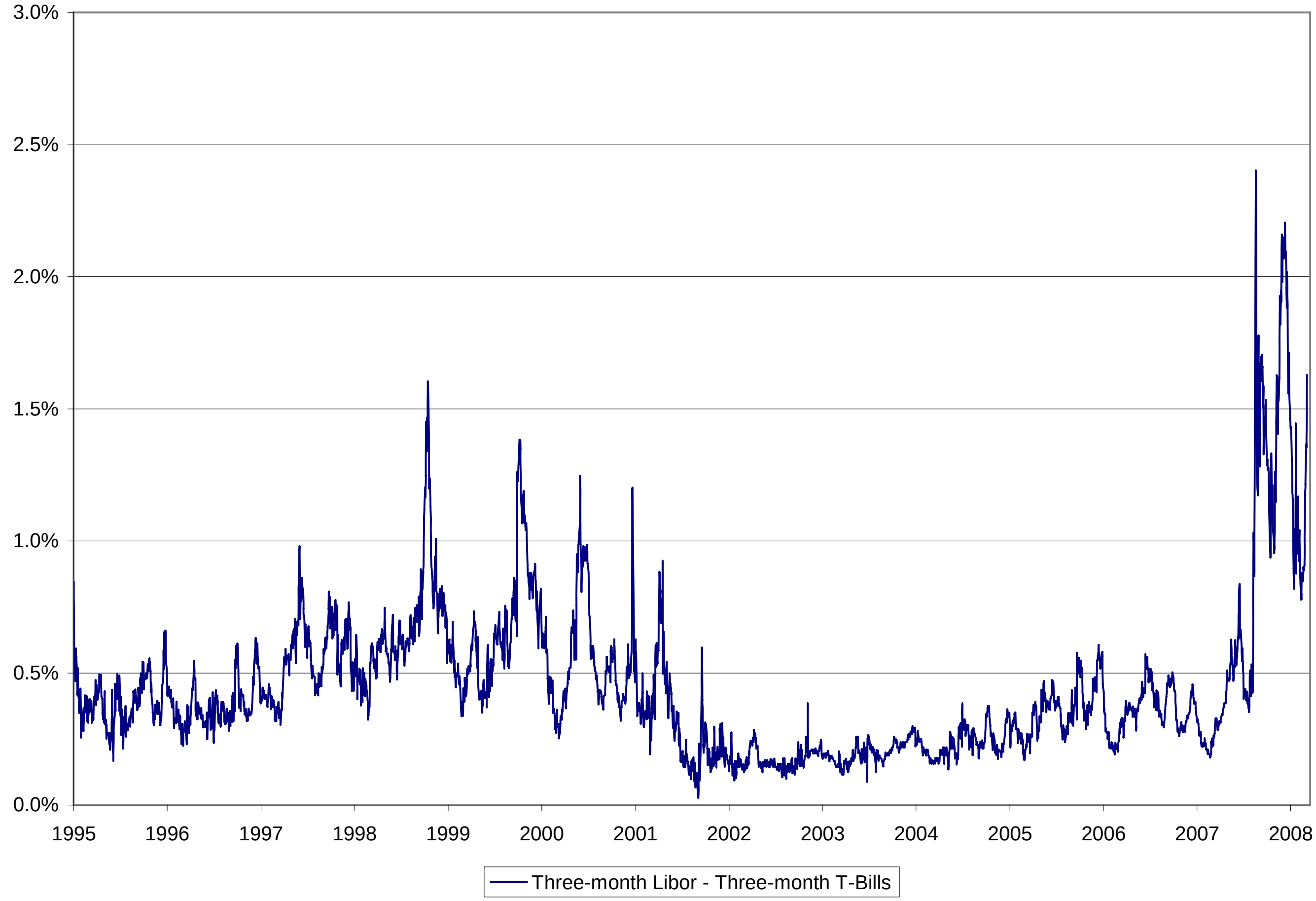
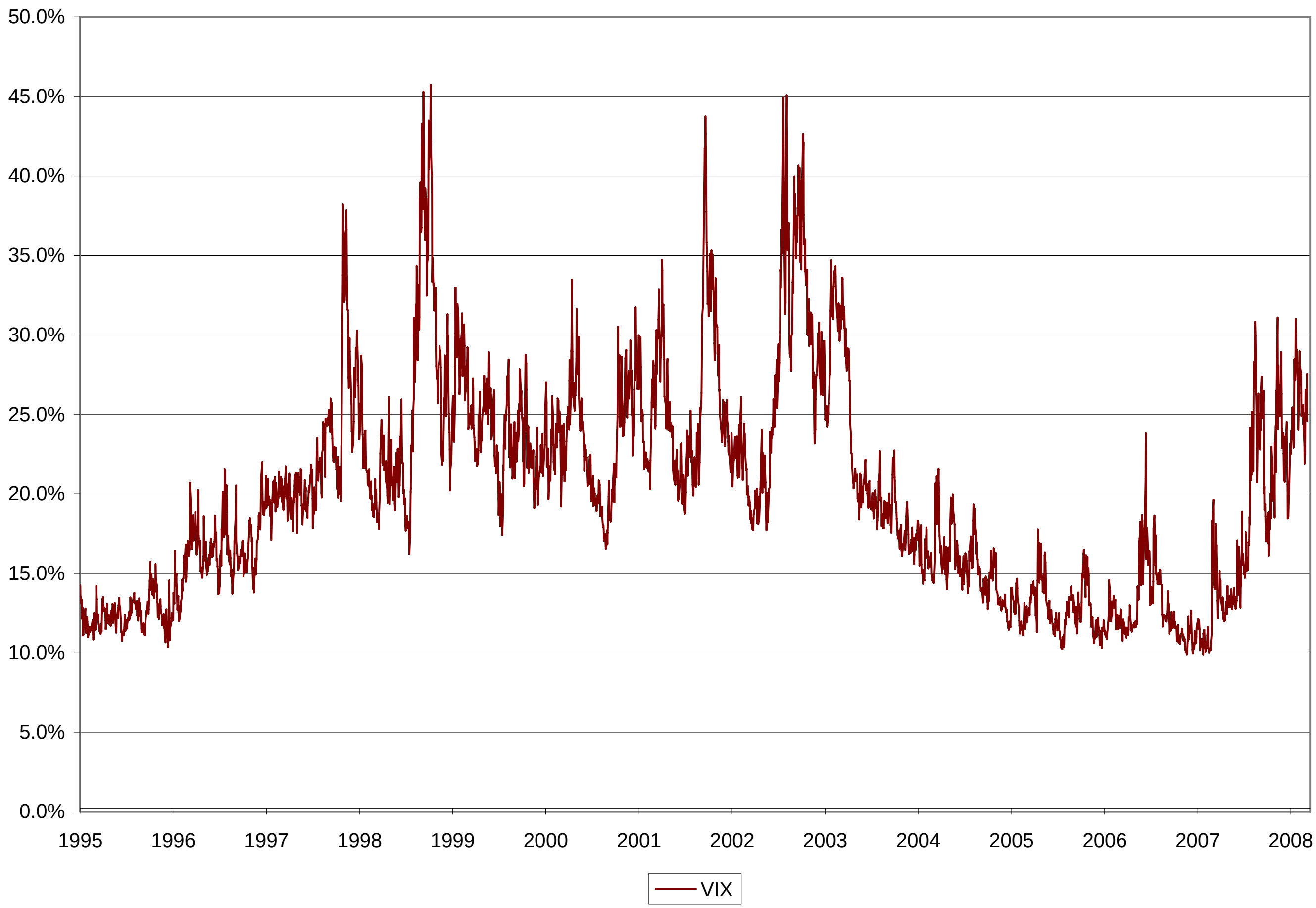
TED spread (LIBOR - T Bills) at record highs



VIX Implied Volatility



	Mean	Std Dev	Max	Min	Last
VIX	19.94%	6.70%	45.74%	9.89%	27.55%

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August 1998 Relative to January 1998 – January 2008

	Monthly Excess Return	Monthly Ranking: Worst(1) to Best (121)
CSFB-Tremont Hedge Fund Index	-7.95%	1
CSFB-Tremont HFI Convertible Arbitrage	-5.04%	1
CSFB-Tremont HFI Dedicated Short Bias	22.31%	121
CSFB-Tremont HFI Emerging Markets	-23.43%	1
CSFB-Tremont HFI Equity Market Neutral	-1.25%	1
CSFB-Tremont HFI Event Driven	-12.17%	1
CSFB-Tremont HFI Fixed Income Arbitrage	-1.86%	5
CSFB-Tremont HFI Global Macro	-5.24%	4
CSFB-Tremont HFI Long-Short Equity	-11.83%	1
CSFB-Tremont HFI Managed Futures	9.55%	121
CSFB-Tremont HFI Multi-Strategy	0.74%	72
S&P 500	-14.87%	1
Russell 2000 Index	-19.79%	1
Lehman Aggregate Bond Index	1.23%	106
Merrill High Yield	-5.45%	3
MSCI Emerging Markets Free	-29.32%	1
VIX Index	44.28%	121
Ann. Daily Std. Dev. Of S&P500	32.06%	115
Average Daily Dispersion of US Listed Stocks	2.42%	95
Change in one-month Treasury Yield	0.06%	75
Month-end 1/10 Swaption Implied Volatility	13.40%	13
Daily Std. Deviation of 10-year US Treasury Yield	0.14%	103


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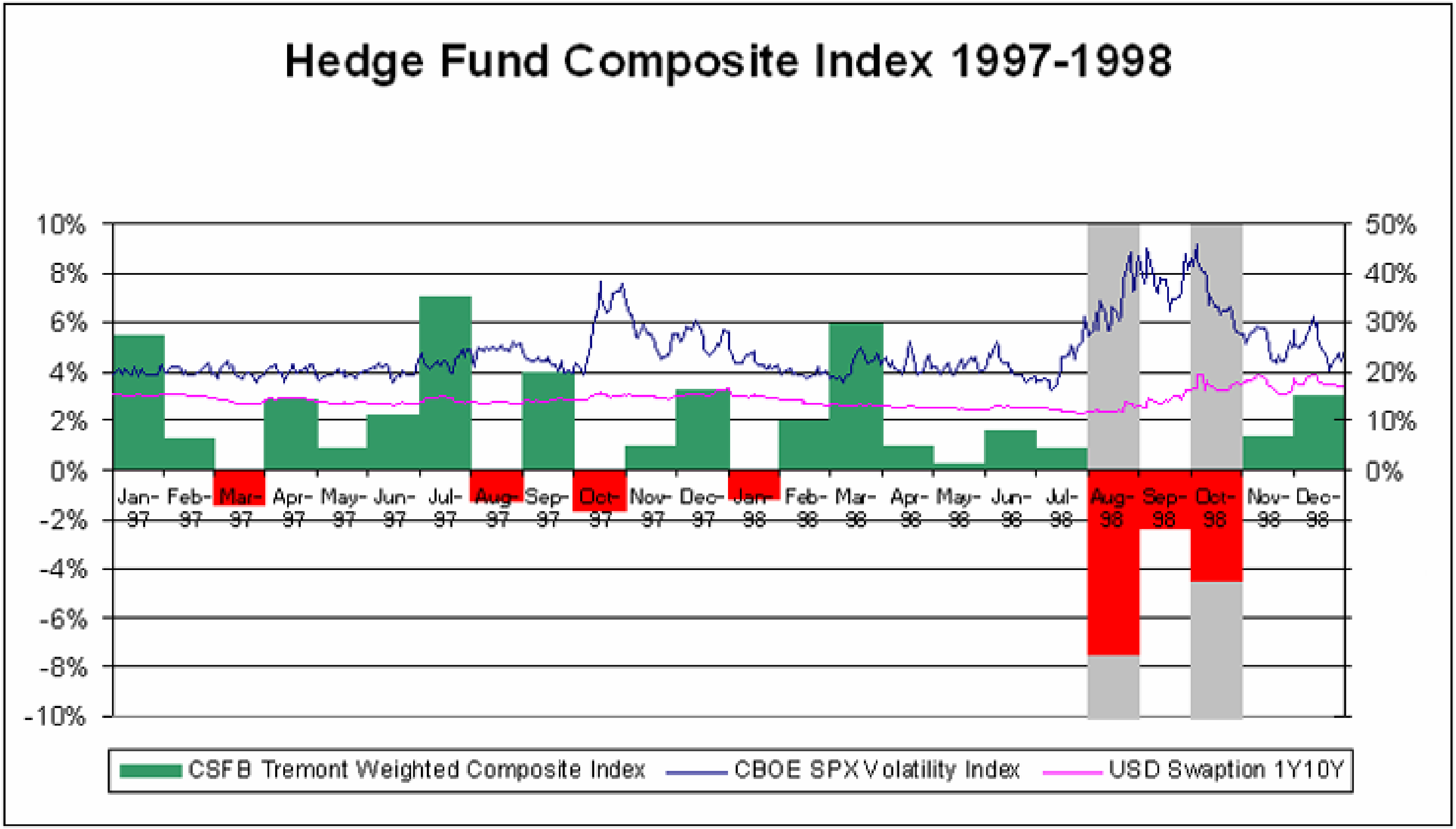
Hedge Fund Composite Index 1997-1998
10%
8%
6%
4%
2%
0%
-2%
-4%
-6%
-8%
-10%
50%
40%
30%
20%
10%
0%
Jan-97 Feb-97 Mar-97 Apr-97 May-97 Jun-97 Jul-97 Aug-97 Sep-97 Oct-97 Nov-97 Dec-97 Jan-98 Feb-98 Mar-98 Apr-98 May-98 Jun-98 Jul-98 Aug-98 Sep-98 Oct-98 Nov-98 Dec-98
CSFB Tremont Weighted Composite Index
CBOE SPX Volatility Index
USD Swaption 1Y10Y

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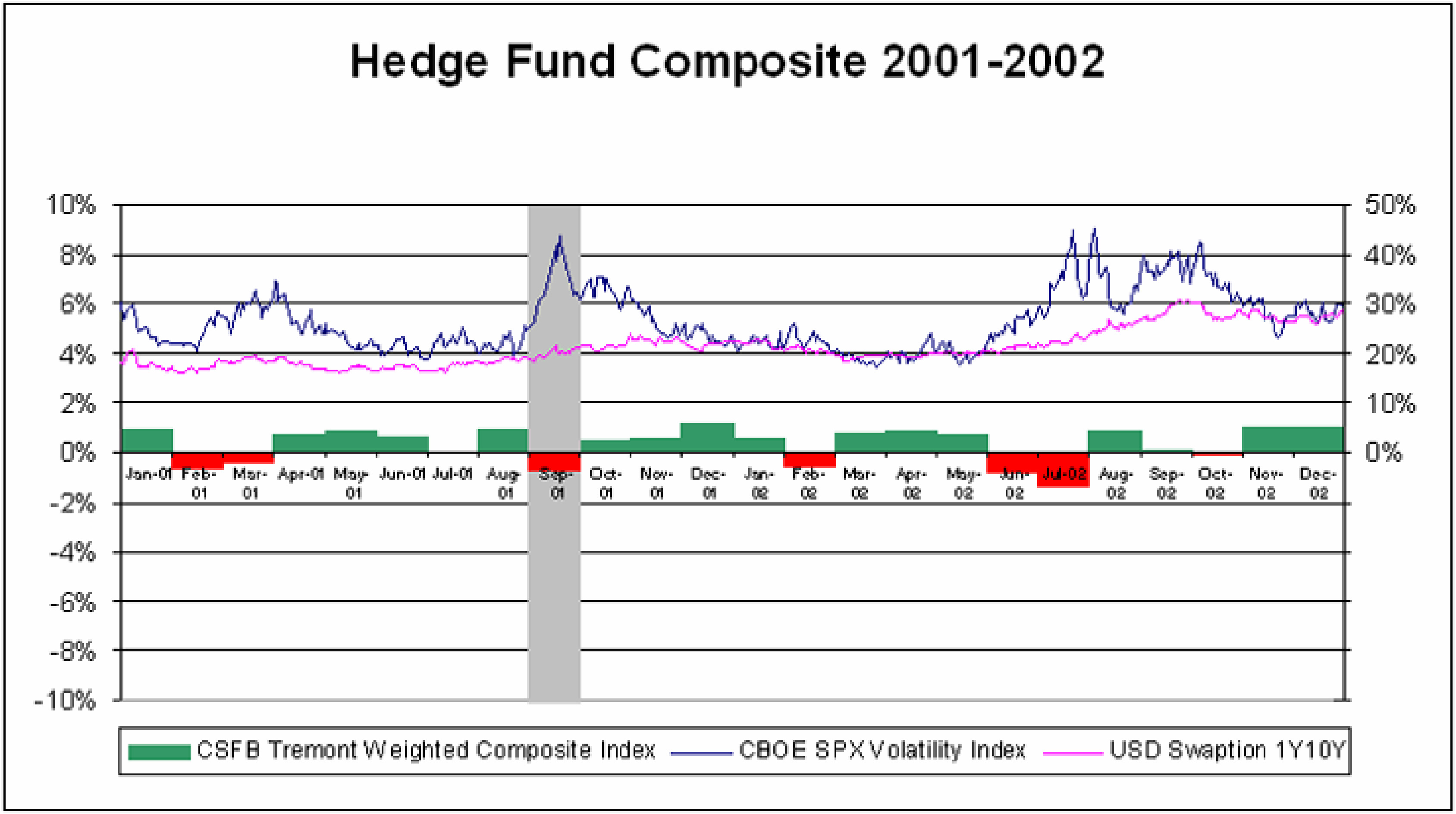
September 2001 Relative to January 1998 – January 2008

	Monthly Excess Return	Monthly Ranking: Worst(1) to Best (121)
CSFB-Tremont Hedge Fund Index	-1.11%	19
CSFB-Tremont HFI Convertible Arbitrage	0.46%	56
CSFB-Tremont HFI Dedicated Short Bias	2.63%	90
CSFB-Tremont HFI Emerging Markets	-4.66%	9
CSFB-Tremont HFI Equity Market Neutral	-0.33%	8
CSFB-Tremont HFI Event Driven	-1.82%	9
CSFB-Tremont HFI Fixed Income Arbitrage	-0.10%	38
CSFB-Tremont HFI Global Macro	0.89%	64
CSFB-Tremont HFI Long-Short Equity	-1.85%	16
CSFB-Tremont HFI Managed Futures	3.37%	95
CSFB-Tremont HFI Multi-Strategy	-0.77%	11
S&P 500	-8.37%	5
Russell 2000 Index	-13.72%	3
Lehman Aggregate Bond Index	0.88%	92
Merrill High Yield	-7.19%	2
MSCI Emerging Markets Free	-15.76%	2
VIX Index	31.93%	115
Ann. Daily Std. Dev. Of S&P500	38.23%	120
Average Daily Dispersion of US Listed Stocks	3.02%	117
Change in one-month Treasury Yield	-0.38%	15
Month-end 1/10 Swaption Implied Volatility	20.80%	87
Daily Std. Deviation of 10-year US Treasury Yield	0.13%	98



Hedge Fund Composite 2001-2002
10%
8%
6%
4%
2%
0%
-2%
-4%
-6%
-8%
-10%
50%
40%
30%
20%
10%
0%
Jan-01 Feb-01 Mar-01 Apr-01 May-01 Jun-01 Jul-01 Aug-01 Sep-01 Oct-01 Nov-01 Dec-01 Jan-02 Feb-02 Mar-02 Apr-02 May-02 Jun-02 Jul-02 Aug-02 Sep-02 Oct-02 Nov-02 Dec-02
CSFB Tremont Weighted Composite Index
CBOE SPX Volatility Index
USD Swaption 1Y10Y

July 2002 Relative to January 1998 – January 2008

	Monthly Excess Return	Monthly Ranking: Worst(1) to Best (121)
CSFB-Tremont Hedge Fund Index	-1.49%	16
CSFB-Tremont HFI Convertible Arbitrage	-1.69%	9
CSFB-Tremont HFI Dedicated Short Bias	4.27%	103
CSFB-Tremont HFI Emerging Markets	-1.33%	32
CSFB-Tremont HFI Equity Market Neutral	1.70%	117
CSFB-Tremont HFI Event Driven	-3.24%	3
CSFB-Tremont HFI Fixed Income Arbitrage	0.94%	97
CSFB-Tremont HFI Global Macro	2.01%	96
CSFB-Tremont HFI Long-Short Equity	-3.09%	9
CSFB-Tremont HFI Managed Futures	5.98%	114
CSFB-Tremont HFI Multi-Strategy	-1.10%	10
S&P 500	-7.90%	6
Russell 2000 Index	-15.25%	2
Lehman Aggregate Bond Index	1.07%	100
Merrill High Yield	-4.03%	5
MSCI Emerging Markets Free	-7.75%	15
VIX Index	32.03%	116
Ann. Daily Std. Dev. Of S&P500	42.39%	121
Average Daily Dispersion of US Listed Stocks	2.71%	110
Change in one-month Treasury Yield	0.03%	71
Month-end 1/10 Swaption Implied Volatility	23.30%	100
Daily Std. Deviation of 10-year US Treasury Yield	0.14%	104

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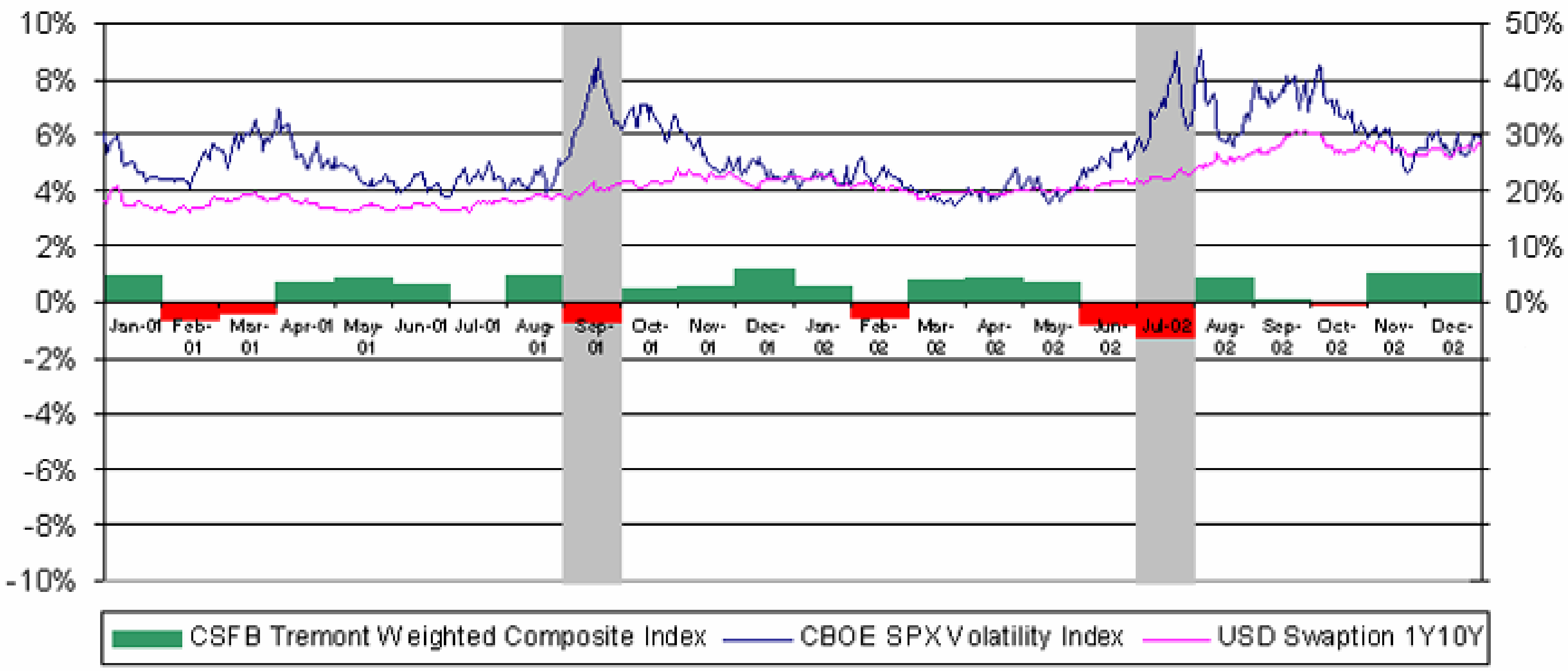
Hedge Fund Composite 2001-2002



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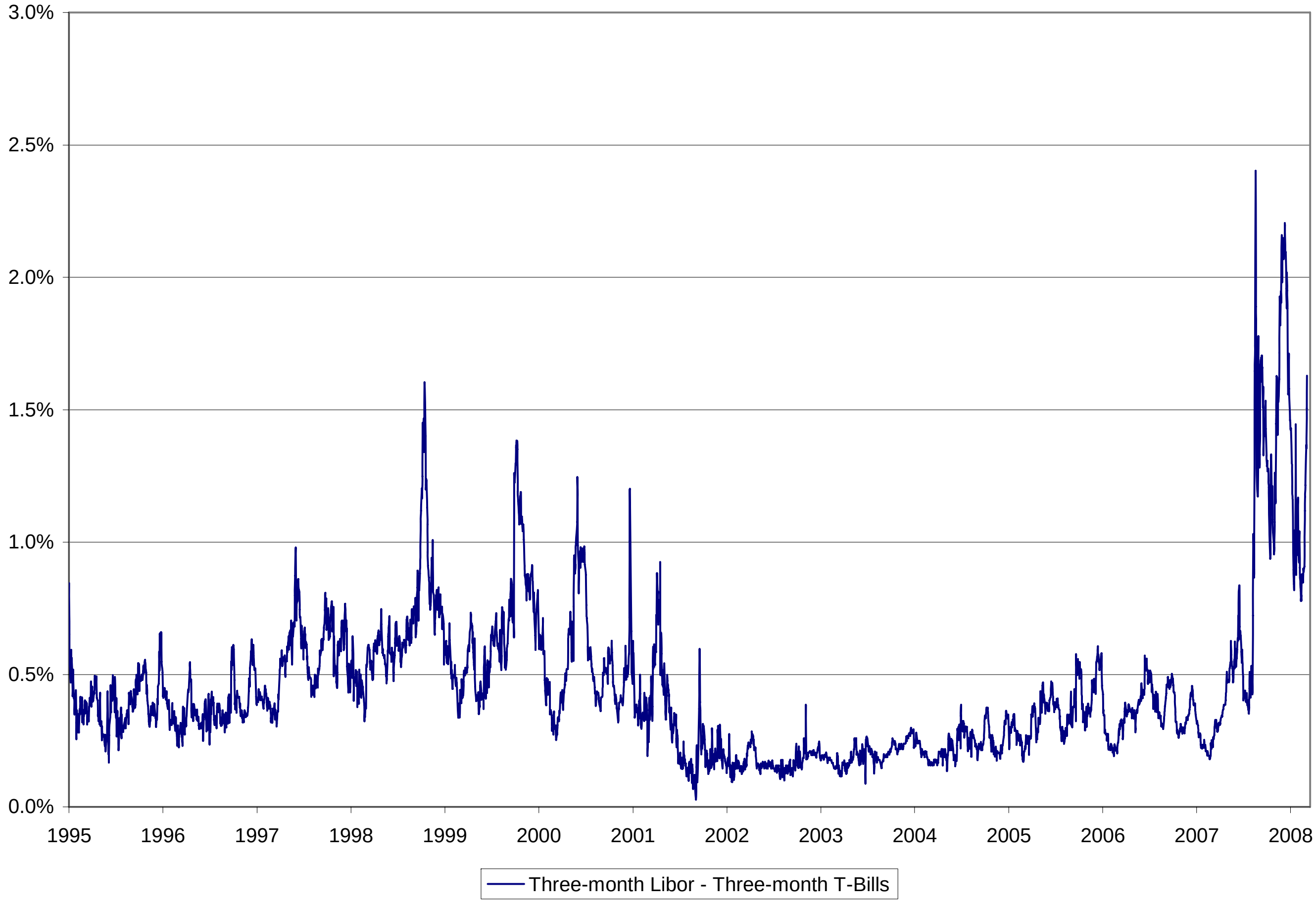
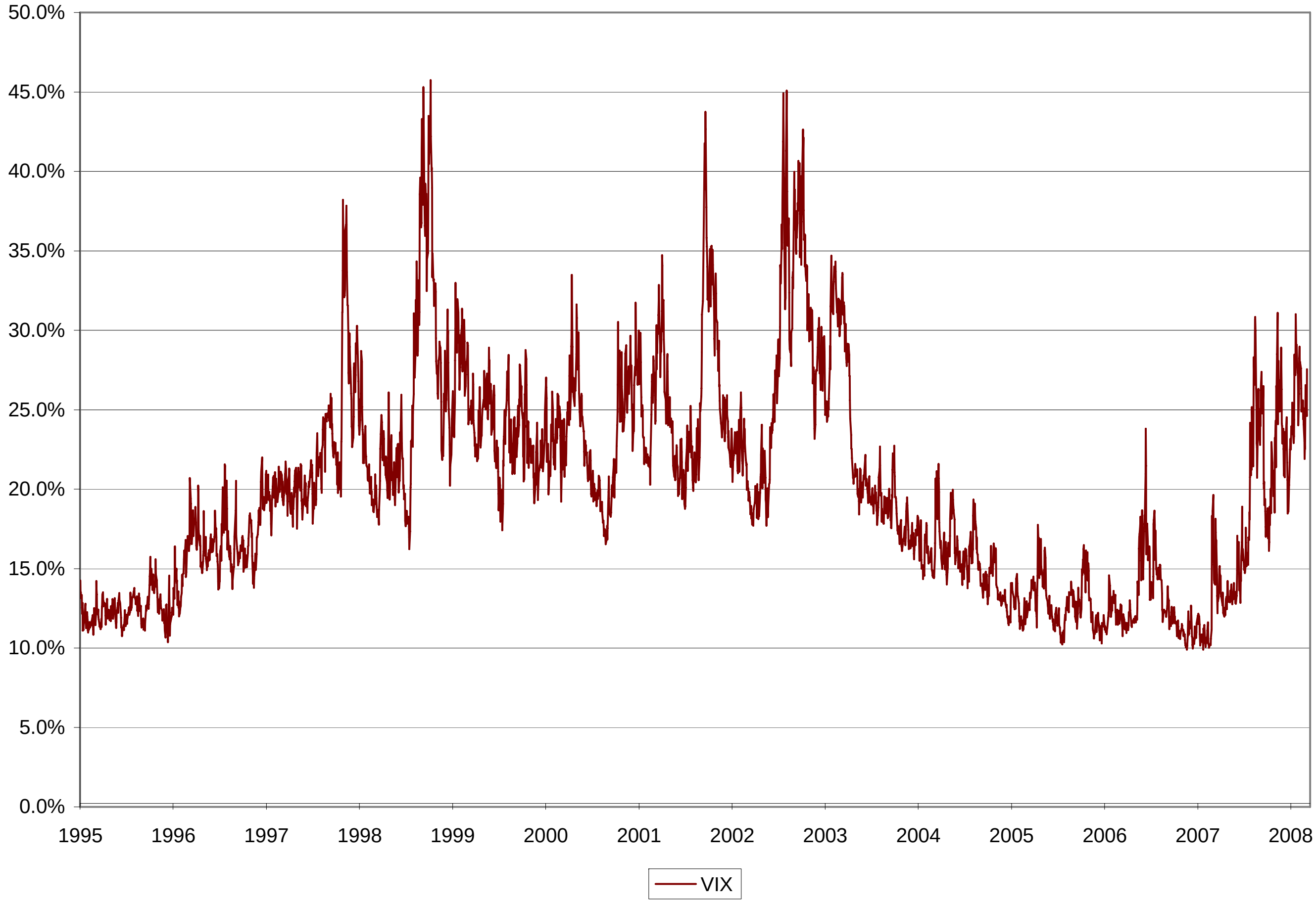
TED spread (LIBOR - T Bills) at record highs



VIX Implied Volatility



	Mean	Std Dev	Max	Min	Last
VIX	19.94%	6.70%	45.74%	9.89%	27.55%

August 2007 Relative to January 1998 – January 2008

	Monthly Excess Return	Monthly Ranking: Worst(1) to Best (121)
CSFB-Tremont Hedge Fund Index	-1.95%	7
CSFB-Tremont HFI Convertible Arbitrage	-1.50%	10
CSFB-Tremont HFI Dedicated Short Bias	-1.56%	54
CSFB-Tremont HFI Emerging Markets	-2.79%	22
CSFB-Tremont HFI Equity Market Neutral	-0.81%	2
CSFB-Tremont HFI Event Driven	-2.30%	6
CSFB-Tremont HFI Fixed Income Arbitrage	-1.29%	8
CSFB-Tremont HFI Global Macro	-1.04%	18
CSFB-Tremont HFI Long-Short Equity	-1.80%	17
CSFB-Tremont HFI Managed Futures	-5.03%	9
CSFB-Tremont HFI Multi-Strategy	-1.82%	5
S&P 500	1.08%	69
Russell 2000 Index	1.85%	73
Lehman Aggregate Bond Index	0.81%	87
Merrill High Yield	0.69%	71
MSCI Emerging Markets Free	-2.51%	30
VIX Index	23.38%	78
Ann. Daily Std. Dev. Of S&P500	24.14%	101
Average Daily Dispersion of US Listed Stocks	2.38%	94
Change in one-month Treasury Yield	0.75%	119
Month-end 1/10 Swaption Implied Volatility	16.30%	50
Daily Std. Deviation of 10-year US Treasury Yield	0.10%	78

November 2007 Relative to January 1998 – January 2008

	Monthly Excess Return	Monthly Ranking: Worst(1) to Best (121)
CSFB-Tremont Hedge Fund Index	-1.53%	15
CSFB-Tremont HFI Convertible Arbitrage	-1.81%	7
CSFB-Tremont HFI Dedicated Short Bias	9.98%	118
CSFB-Tremont HFI Emerging Markets	-2.18%	23
CSFB-Tremont HFI Equity Market Neutral	0.24%	43
CSFB-Tremont HFI Event Driven	-2.00%	8
CSFB-Tremont HFI Fixed Income Arbitrage	-0.58%	20
CSFB-Tremont HFI Global Macro	-0.49%	24
CSFB-Tremont HFI Long-Short Equity	-2.04%	15
CSFB-Tremont HFI Managed Futures	-1.28%	42
CSFB-Tremont HFI Multi-Strategy	-1.46%	6
S&P 500	-4.51%	15
Russell 2000 Index	-7.51%	7
Lehman Aggregate Bond Index	1.49%	111
Merrill High Yield	-2.37%	12
MSCI Emerging Markets Free	-7.41%	18
VIX Index	22.87%	75
Ann. Daily Std. Dev. Of S&P500	26.35%	108
Average Daily Dispersion of US Listed Stocks	2.22%	86
Change in one-month Treasury Yield	0.50%	114
Month-end 1/10 Swaption Implied Volatility	21.30%	91
Daily Std. Deviation of 10-year US Treasury Yield	0.16%	113

January 2008 Relative to January 1998 – January 2008

	Monthly Excess Return	Monthly Ranking: Worst(1) to Best (121)
CSFB-Tremont Hedge Fund Index	-1.71%	9
CSFB-Tremont HFI Convertible Arbitrage	-0.76%	17
CSFB-Tremont HFI Dedicated Short Bias	5.45%	108
CSFB-Tremont HFI Emerging Markets	-2.90%	21
CSFB-Tremont HFI Equity Market Neutral	0.46%	61
CSFB-Tremont HFI Event Driven	-2.67%	5
CSFB-Tremont HFI Fixed Income Arbitrage	0.05%	41
CSFB-Tremont HFI Global Macro	4.21%	118
CSFB-Tremont HFI Long-Short Equity	-4.28%	5
CSFB-Tremont HFI Managed Futures	3.90%	102
CSFB-Tremont HFI Multi-Strategy	-2.04%	4
S&P 500	-6.23%	10
Russell 2000 Index	-7.05%	10
Lehman Aggregate Bond Index	-0.23%	38
Merrill High Yield	-1.59%	19
MSCI Emerging Markets Free	-12.68%	4
VIX Index	26.20%	100
Ann. Daily Std. Dev. Of S&P500	24.13%	100
Average Daily Dispersion of US Listed Stocks	2.63%	107
Change in one-month Treasury Yield	-0.96%	3
Month-end 1/10 Swaption Implied Volatility	25.50%	103
Daily Std. Deviation of 10-year US Treasury Yield	0.14%	105

What is the conclusion of the data analysis?

The market can stay irrational longer than you can stay solvent

"The market can stay irrational longer than you can stay solvent."

John Maynard Keynes, circa 1929

How can this be managed?

The relationship between volatility and liquidity events is strong enough to justify an *uncertainty* overlay of long volatility positions as a prudent means by which to manage the uncertainty of potential future liquidity events.

A long volatility position is sometimes expressed as a positive convexity or long gamma position.

Such an overlay has a negative expected return, but generates outsized returns in periods of increasing volatility (uncertainty).

The *uncertainty* overlays managed by APM realized over 30% returns in 2007 and 10% in January 2008.

The relationship between volatility and liquidity events suggests that an overlay of long volatility positions is a good hedge against the shocks of liquidity events

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Advanced Portfolio Management (APM) is a specialty asset management company that constructs and manages customized portfolios of hedge funds and other financial instruments for endowments, foundations, pension funds, insurance companies, and other financial institutions in North America, Europe, and Asia. Each APM product is designed to complement, enhance, and complete an existing asset allocation and investment portfolio. All products are managed to realize the client's unique investment objectives and risk parameters. APM products are currently utilized as active management overlays, alpha transport programs, completion funds, and stand-alone multi-manager hedge fund investments.

APM's investment process integrates experienced qualitative investment judgment with rigorous analytical structure. The professionals at APM have nearly 100 years of combined investment and capital markets experience providing a comprehensive understanding of the potential profit opportunities and the accompanying risks of active investing. To complement this experience and judgment, APM has constructed a state-of-the-art analytical platform which comprises: (i) manager-level risk and return attribution analysis and risk budgeting, (ii) non-linear Monte Carlo simulation processes driven by forward-looking expectations of return and risk, and (iii) portfolio optimization and rebalancing in a shortfall risk framework.

By integrating experienced qualitative insights with robust analytical methods, APM delivers superior risk-adjusted returns with negligible correlation or beta to the major market factors or benchmarks. APM is a registered Investment Advisor with the US Securities and Exchange Commission (SEC).

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