The Best Strategies for the Worst Crises

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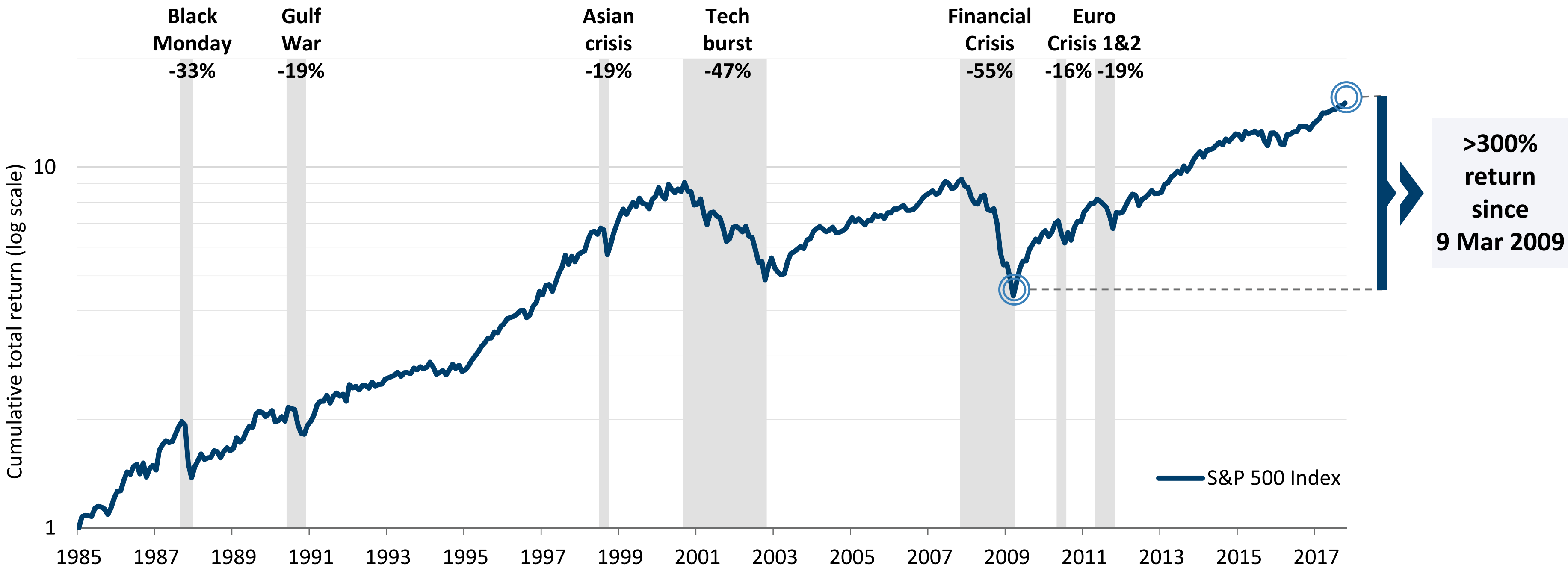
After a lost decade, the S&P 500 Index has experienced robust growth



Past performance is not indicative of future results.

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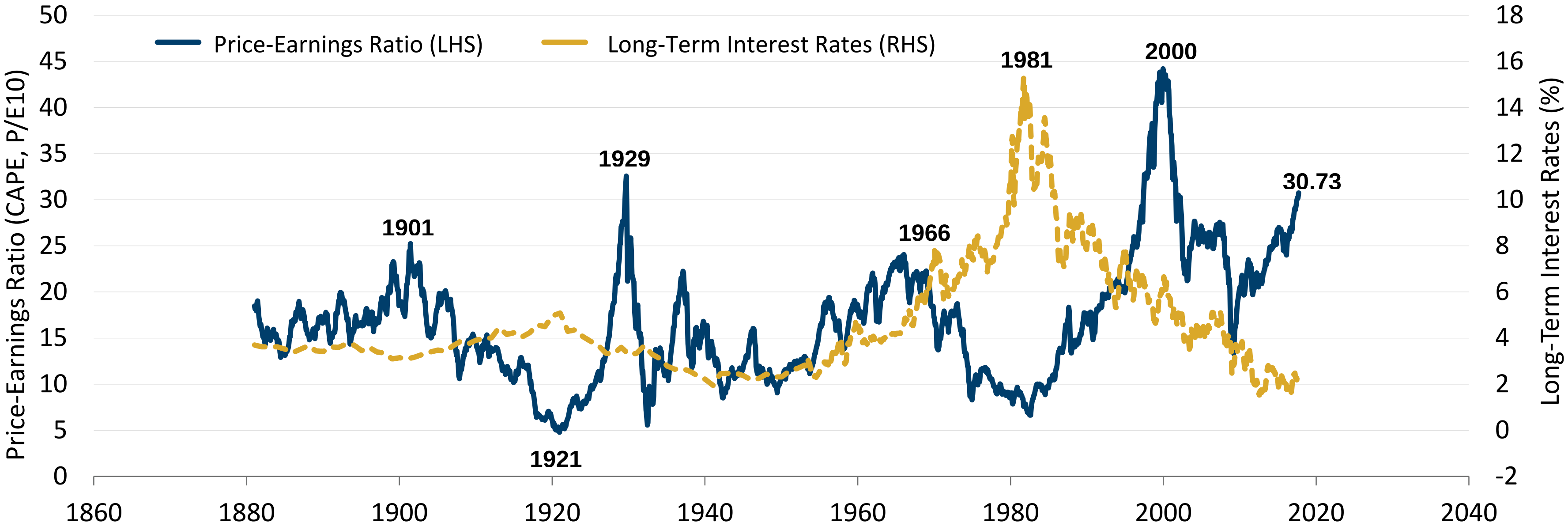
The periods selected are exceptional and the results do not reflect typical performance. The start and end dates of such events are subjective and different sources may suggest different date ranges, leading to different performance figures. Source: Man Group database. As at 30 September 2017.

Traditional equity-bond portfolio looks vulnerable to an equity market selloff



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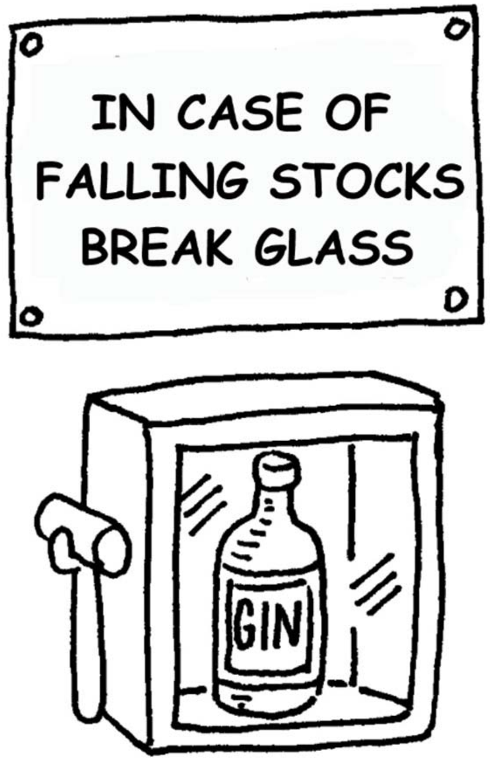
Source: 1. http://www.econ.yale.edu/~shiller/data.htm as at 3 October 2017.

So what to do?



Passive strategies

Buying protection

Long puts: expensive

One-month, at-the-money S&P 500 put options[1]

	Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Crisis (14%)	Normal (86%)	All (100%)	All (100%)
Strategy				**Total return**					**Annualized return**		**St. dev.**
S&P 500 (excess)	-33.5%	-20.7%	-19.7%	-51.0%	-56.3%	-15.7%	-18.6%	-45.1%	20.2%	7.3%	16.7%
Long puts (excess)	38.0%	12.4%	15.5%	44.7%	40.5%	15.8%	13.4%	40.2%	-13.7%	-7.7%	11.4%

Payoff broadly matches loss for each crisis

Expensive

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1. Minus the CBOE S&P500 PutWrite Index, corrected for cash. The periods selected are exceptional and the results do not reflect typical performance. The start and end dates of such events are subjective and different sources may suggest different date ranges, leading to different performance figures.
Source: Man Group Database.

Buying protection

Long credit protection: uneven crisis payoff

Short corporate credit index, long 10y Treasury hedge, scaled to 10% vol[2]

	Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Crisis (14%)	Normal (86%)	All (100%)	All (100%)
Strategy				**Total return**					**Annualized return**		**St. dev.**
S&P 500 (excess)	-33.5%	-20.7%	-19.7%	-51.0%	-56.3%	-15.7%	-18.6%	-45.1%	20.2%	7.3%	16.7%
Short credit risk (excess)	9.2%	7.5%	12.0%	16.9%	127.3%	11.6%	26.0%	41.0%	-5.2%	0.4%	10.0%

Uneven payoff, more for liquidity crises

Less expensive (yet negative long-term expectation)

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1. BofA Merrill Lynch US Corp Master Total Return index. The periods selected are exceptional and the results do not reflect typical performance. The start and end dates of such events are subjective and different sources may suggest different date ranges, leading to different performance figures.
Source: Man Group Database.

Investing in “safe-haven” securities

Long gold: small crisis payoff for risk taken

Gold futures

Strategy	Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Crisis (14%)	Normal (86%)	All (100%)	All (100%)
	Total return							Annualized return			St. dev.
S&P 500 (excess)	-33.5%	-20.7%	-19.7%	-51.0%	-56.3%	-15.7%	-18.6%	-45.1%	20.2%	7.3%	16.7%
Long gold (excess)	4.4%	5.5%	-6.9%	7.5%	18.9%	4.6%	6.3%	8.4%	-0.7%	0.5%	16.1%

6/7 times positive, but small payoff for risk taken

Supply/demand risk

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Source: Man Group Database.

Investing in "safe-haven" securities

Long bonds: unreliable crisis hedge

10-year Treasury futures

Strategy	Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Crisis (14%)	Normal (86%)	All (100%)	All (100%)
	Total return							Annualized return			St. dev.
S&P 500 (excess)	-33.5%	-20.7%	-19.7%	-51.0%	-56.3%	-15.7%	-18.6%	-45.1%	20.2%	7.3%	16.7%
Long bonds (excess)	-8.3%	-2.7%	3.0%	24.2%	20.4%	5.7%	10.1%	10.7%	3.4%	4.4%	6.5%

No crisis hedge pre-2000
(see next slide also)

Good return post 1985, but yield compression over and current yield low

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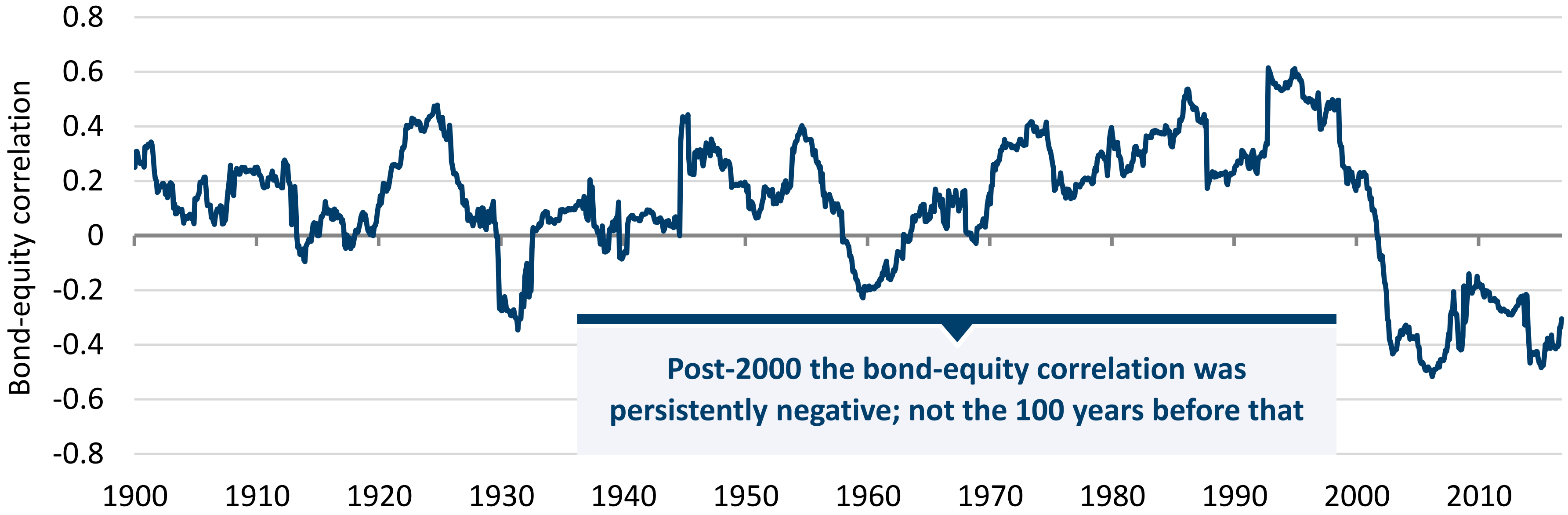
Source: Man Group Database.

Bonds were unreliable crisis hedge 100 years before 2000



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Source: Man Group Database.

Dynamic futures:
time-series momentum

How about dynamic strategies as crisis hedge?

A perfect hedge does not exist… we look for a dynamic strategy that:

- Performed positively over the long-run, and
- Performed particularly well during crises, and
- Intuitively benefit from a crisis environment

Intuition futures time-series momentum: resembles a long volatility strategy

- Property of adding to winners, cutting losers is similar to dynamic replication of long option straddle position

Key modelling assumptions

- Standard 1-, 3- and 12-month momentum signal
- Evaluate for 50 liquid futures from 1985
- Equal risk to commodities, currencies, equity, fixed income
- 10% ex-ante volatility

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Performance 3-month futures time-series momentum

① Unconstrained: already performs well during crises

Strategy		Total return crisis periods							Annualized return			Other statistics		
		Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Crisis (14%)	Normal (86%)	All (100%)	SR	Corr. to S&P500	IR to S&P500
3m MOM	Unconstrained	10.3%	10.5%	9.3%	50.7%	32.6%	0.5%	10.9%	26.4%	6.4%	9.1%	0.93	-0.13	1.00

② EQ position cap: even better crisis performance at modest decrease in all performance

Strategy		Total return crisis periods							Annualized return			Other statistics		
		Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Crisis (14%)	Normal (86%)	All (100%)	SR	Corr. to S&P500	IR to S&P500
3m MOM	EQ position cap	15.4%	18.7%	14.4%	61.3%	41.4%	4.7%	13.7%	36.6%	4.0%	8.2%	0.84	-0.36	1.10

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Source: Man Group database.

Performance 3-month futures time-series momentum

③ EQ beta cap: has worked slightly less well than EQ position cap during crises and overall

Strategy		Total return crisis periods							Annualized return			Other statistics		
		Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Crisis (14%)	Normal (86%)	All (100%)	SR	Corr. to S&P500	IR to S&P500
3m MOM	EQ beta cap	10.0%	15.6%	12.5%	60.3%	40.9%	4.3%	13.5%	33.6%	4.1%	7.9%	0.82	-0.30	1.02

④ ALL beta cap: much lower overall performance, no better crisis performance (unstable non-equity beta)

Strategy		Total return crisis periods							Annualized return			Other statistics		
		Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Crisis (14%)	Normal (86%)	All (100%)	SR	Corr. to S&P500	IR to S&P500
3m MOM	ALL beta cap	13.0%	15.4%	12.7%	66.1%	44.0%	3.5%	18.3%	37.0%	2.0%	6.4%	0.67	-0.36	0.92

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Source: Man Group database.

Dynamic L/S stocks: quality factor

Quality stands out among stock factors

Factor	Total return							Annualized return			Other statistics		
	Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Crisis (14%)	Normal (86%)	All (100%)	SR	Corr. to S&P500	IR to S&P500
Market (NYSE, AMEX, NASDAQ)	-30.1%	-22.2%	-21.3%	-51.8%	-55.8%	-16.1%	-20.3%	-45.3%	20.3%	7.3%	0.51	0.99	-0.01
Size	9.5%	-11.0%	-8.6%	29.4%	-5.5%	-3.8%	-10.1%	-1.3%	0.4%	0.1%	0.06	-0.03	0.07
Value	4.4%	7.3%	5.6%	72.0%	-23.2%	-8.9%	-7.7%	6.0%	2.4%	2.9%	0.35	-0.11	0.41
Profitability (Robust - Weak)	-2.3%	-1.0%	5.2%	123.4%	31.5%	2.2%	13.3%	30.7%	0.4%	4.3%	0.59	-0.27	0.75
Investment (Conservative - Aggressive)	4.0%	12.3%	9.8%	61.2%	0.2%	-1.9%	-4.7%	15.3%	1.3%	3.2%	0.50	-0.35	0.73
Momentum	-7.9%	10.0%	2.3%	39.3%	35.7%	-5.4%	1.3%	14.5%	4.8%	6.2%	0.50	-0.14	0.58
Quality (Quality - Junk)	1.5%	7.7%	9.1%	101.9%	67.3%	7.6%	24.1%	43.7%	-0.1%	5.3%	0.64	-0.49	1.02
Low risk (Bet-against-Beta)	3.1%	-1.3%	-0.1%	115.3%	-32.0%	3.8%	5.3%	11.1%	8.6%	8.9%	0.81	-0.37	1.08

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Source: Man Group database.

Quality comes in four broad types

Quality → companies that deserve a higher Price/Book ratio: following Asness, Frazzini, and Pedersen (2013)

$$\frac{P}{B} = \frac{\text{Profitability} * \text{PayoutRatio}}{\text{Required Return} - \text{Growth}}$$

1. **Profitability:** {gross profits, earnings, cash flows} scaled by {book equity, book assets, sales}
2. **Growth:** trailing five-year growth of a profitability measure
3. **Safety (companies commanding a lower required return)**
   – Return-based measures include market beta and volatility
   – Fundamental-based measures include low leverage, low volatility of profitability and low credit risk
4. **Payout:** fraction of profits paid out to shareholders; a measure of “shareholder friendliness” of management

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Source: Man Group database.

Quality empirical evaluation

Profitability, payout, safety look promising with payoff largest during tech burst

Category	Construction	Total return							Annualized return			Other statistics		
		Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Crisis (14%)	Normal (86%)	All (100%)	SR	Corr. to S&P500	IR to S&P500
Profitability	A: Beta-neutral	2.8%	3.5%	11.2%	219.9%	26.2%	3.0%	4.1%	42.2%	1.4%	6.5%	0.57	-0.19	0.69
Payout	A: Beta-neutral	-3.3%	9.8%	14.5%	267.1%	16.0%	1.5%	1.4%	43.4%	4.2%	9.1%	0.79	-0.18	0.89
Growth	A: Beta-neutral		-3.4%	-6.4%	-18.4%	13.7%	3.6%	3.1%	-2.3%	-0.7%	-1.1%	-0.04	0.05	-0.06
Safety	A: Beta-neutral	-4.2%	5.8%	1.0%	123.9%	-10.9%	2.1%	5.1%	18.4%	5.4%	7.2%	0.64	-0.02	0.64

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Source: Man Group database.

Quality empirical evaluation

Here dollar-neutral → paying equity premium & beta-neutral → positive convexity (good crisis, ok normal perf)

Category	Construction	Total return: Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Annualized return: Crisis (14%)	Normal (86%)	All (100%)	Other statistics: SR	Corr. to S&P500	IR to S&P500
Safety	Dollar-neutral	5.6%	10.6%	10.1%	104.5%	13.5%	8.8%	15.2%	32.9%	-5.0%	-0.2%	0.03	-0.62	0.44
Safety	A: Beta-neutral	-4.2%	5.8%	1.0%	123.9%	-10.9%	2.1%	5.1%	18.4%	5.4%	7.2%	0.64	-0.02	0.64

Drilling down to specific formulations → low beta hurt during liquidity crises (in contrast to low idiosyncratic vol.)

Category	Name	Total return: Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Annualized return: Crisis (14%)	Normal (86%)	All (100%)	Other statistics: SR	Corr. to S&P500	IR to S&P500
Safety	Low beta	-7.7%	-5.6%	-8.3%	95.5%	-19.5%	1.1%	3.6%	6.1%	10.9%	10.6%	0.91	0.23	0.82
Safety	Low idiosyncratic volatilty	-0.3%	12.6%	10.2%	131.9%	4.3%	1.5%	5.6%	28.6%	1.5%	5.2%	0.47	-0.19	0.58

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Source: Man Group database.

Putting it all together

Futures momentum and Quality stocks can be scaled to make a difference

Portfolio	Total return							Annualized return			Other statistics			
Hedge Proportion	Black Monday	Gulf war	Asian crisis	Tech burst	Financial crisis	Euro crisis I	Euro crisis II	Crisis (14%)	Normal (86%)	All (100%)	SR	Corr. to S&P500	IR to S&P500	St. Dev.
0%	-32.9%	-19.2%	-19.2%	-47.4%	-55.2%	-15.6%	-18.6%	-43.5%	24.5%	11.0%	0.71	1.00	N.A.	16.7%
10%	-29.1%	-15.1%	-15.6%	-33.0%	-48.5%	-13.5%	-15.2%	-35.8%	23.8%	12.6%	0.89	1.00	1.81	14.7%
20%	-25.1%	-10.9%	-11.9%	-15.0%	-40.9%	-11.4%	-11.6%	-27.1%	23.1%	14.1%	1.10	0.98	1.81	12.9%
30%	-20.9%	-6.4%	-8.0%	7.6%	-32.5%	-9.2%	-7.9%	-17.3%	22.4%	15.6%	1.34	0.93	1.81	11.3%
40%	-16.7%	-1.8%	-3.9%	35.8%	-23.0%	-7.0%	-4.2%	-6.5%	21.6%	17.1%	1.61	0.83	1.81	10.2%
50%	-12.3%	3.1%	0.2%	70.8%	-12.4%	-4.8%	-0.3%	5.6%	20.8%	18.5%	1.83	0.66	1.81	9.6%
60%	-7.7%	8.1%	4.6%	114.2%	-0.7%	-2.5%	3.7%	19.0%	19.9%	19.8%	1.94	0.44	1.81	9.6%
70%	-3.0%	13.4%	9.1%	167.8%	12.3%	-0.2%	7.7%	34.0%	19.0%	21.1%	1.92	0.21	1.81	10.3%
80%	1.8%	18.9%	13.8%	233.8%	26.6%	2.1%	11.9%	50.5%	18.1%	22.3%	1.82	0.01	1.81	11.5%
90%	6.8%	24.6%	18.7%	314.8%	42.4%	4.5%	16.1%	68.8%	17.1%	23.5%	1.68	-0.15	1.81	13.1%
100%	11.9%	30.6%	23.7%	413.9%	59.7%	6.9%	20.5%	89.0%	16.1%	24.6%	1.55	-0.27	1.81	15.0%

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Source: Man Group database.

Futures momentum and Quality stocks promising potential alternatives to passive hedge

No perfect passive crisis hedge strategy

Continually buying puts
- Expensive

Long credit protection
- Uneven payoff
- Limits to liquidity

Long gold
- Small payoff
- Gold-specific supply and demand risk

Long bonds
- Unreliable, not a hedge pre-2000
- Current yield low

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Futures momentum and Quality stocks promising potential alternatives to passive hedge

Futures time-series momentum

Intuition: resembles long volatility

Behaviour: needs time to hop on trend and benefits from prolonged crises

Performance: 1- and 3-month momentum have good performance during all crises

Enhancements: equity position cap further enhances crisis performance at limited cost of lower overall performance

Quality stocks

Intuition: “flight-to-quality” during crises, with quality companies profitable, growing, safe, and investor-friendly

Behaviour: mostly accounting based, more of “sit and wait for the crisis” character

Performance: good crisis performance, but more for tech burst (reversal junk rally) than Financial Crisis (credit crisis)

Enhancements: selecting suitable components and portfolio construction matters

Futures momentum and Quality stocks are complementary

Conceptually and empirically (near zero correlation)

Important considerations

Simulated/Hypothetical Blended Index Returns

This material contains historical simulations of hypothetical portfolios. The stated returns are total returns for a hypothetical investment in a portfolio of each of the indicated indices for the stated period, allocated between the indices at the indicated ratio and calculated assuming an annual rebalancing at year-end to the indicated ratio. An index is a hypothetical measure of performance based on the ups and downs of securities that make up a particular market. An index does not show actual investment returns or reflect payment of management or brokerage fees, which would lower the index's performance.

While the stated blended returns are based on historical performance, it is provided for illustrative purposes only and does not represent the actual performance of any investor, portfolio, or a recommendation on the part of an Investment Manager or MII to any particular investor. The goals, risk tolerance and circumstances of each investing institution should be taken into account in determining whether any such blended investment might be appropriate for it.

In addition, the reader should be aware that the assumption underlying these returns - namely, that the investor maintained a steady allocation among the indices and rebalanced annually - is artificial in that it does not take into account changes that might be made in response to significant market events, etc. No representation is made that an actual Investment Product’s performance would have been the same as the Hypothetical Results presented herein. A decision to pursue an investment strategy should not be based on the results of hypothetical back tests.

The depicted performance is also based on an assumption that the investor is not being charged any asset allocation or overall portfolio fee. A decision to invest in any particular strategy should not be based off simulated/hypothetical results.

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