



# Risk Regime Investing

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An investment process is driven by proprietary measures of financial turbulence and systemic risk.

- Financial turbulence measures the statistical unusualness of a set of returns given their historical pattern of behavior.
- Implied systemic risk, through a statistic called the absorption ratio, measures the fraction of market variability that is explained by a subset of the most important factors.



### **Financial turbulence**

The statistical unusualness of a set of returns given their historical pattern of behavior, including:

- Extreme price moves
- Decoupling of correlated assets
- Convergence of uncorrelated assets

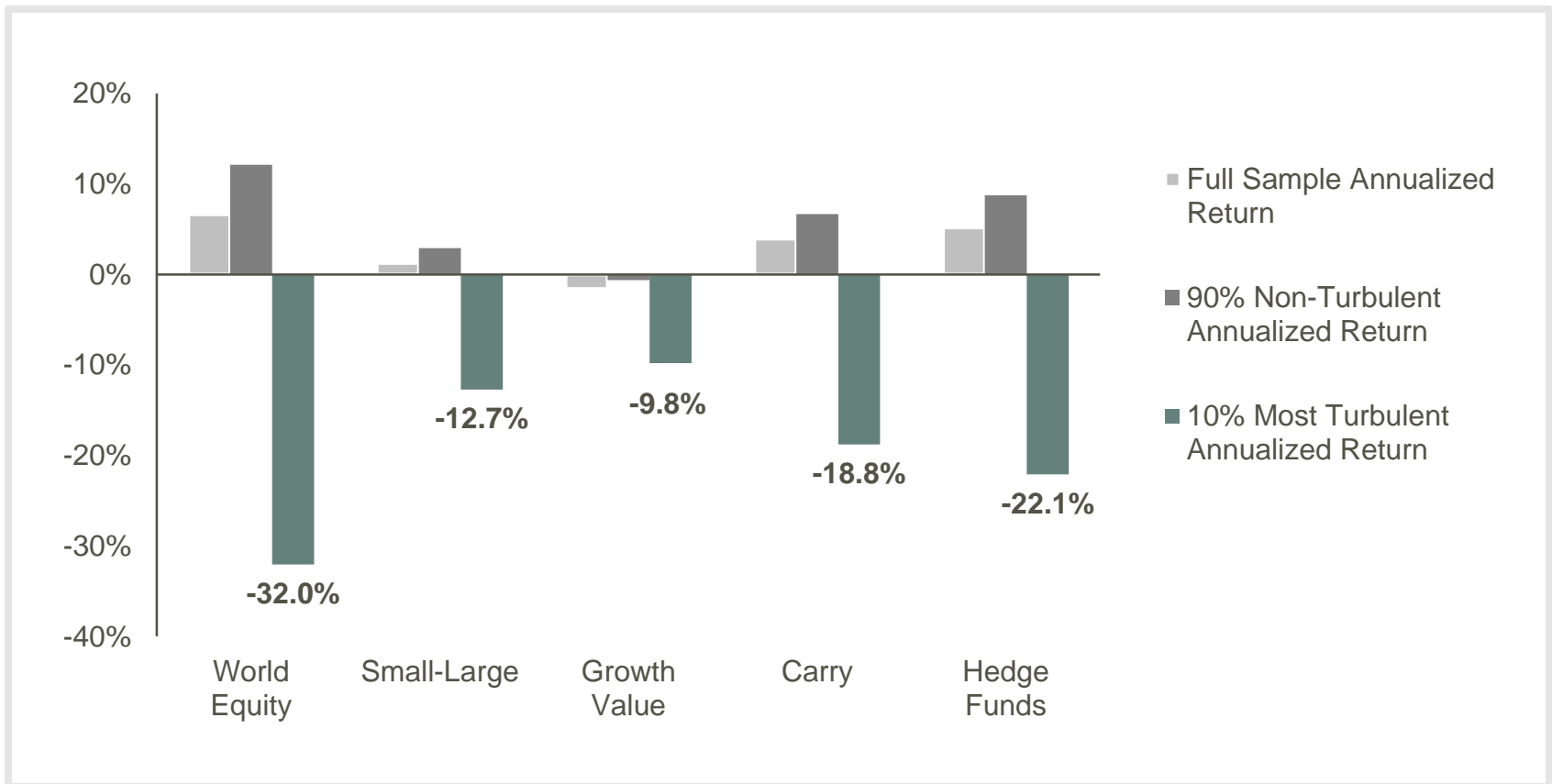
### **Important empirical features of financial turbulence:**

- Returns to risk are lower during turbulent periods
- Although it may arrive unexpectedly, turbulence tends to be persistent



## RISK MEASURES - TURBULENCE

Returns to risk are lower when markets are turbulent\*



\*Date Range: January 1993 through December 2008

Kritzman, Mark, and Yuanzhen Li. "Skulls, Financial Turbulence, and Risk Management." *Financial Analysts Journal* (2010).



### **Systemic risk**

- A measure of the extent to which markets are unified or tightly coupled, which we call the absorption ratio.
- When markets are tightly coupled, they are more fragile in the sense that negative shocks propagate more quickly and broadly than when markets are loosely linked.

### **Important empirical features of systemic risk:**

- Systemic risk tends to rise prior to the most significant market drawdowns
- Systemic risk can be a leading indicator of financial turbulence



## RISK MEASURES – SYSTEMIC RISK

Fraction of equity draw downs preceded by high systemic risk\*

	1% Worst	2% Worst	5% Worst
1 Day	87.50%	84.13%	73.42%
1 Week	81.25%	80.95%	76.58%
1 Month	100.00%	98.41%	89.81%

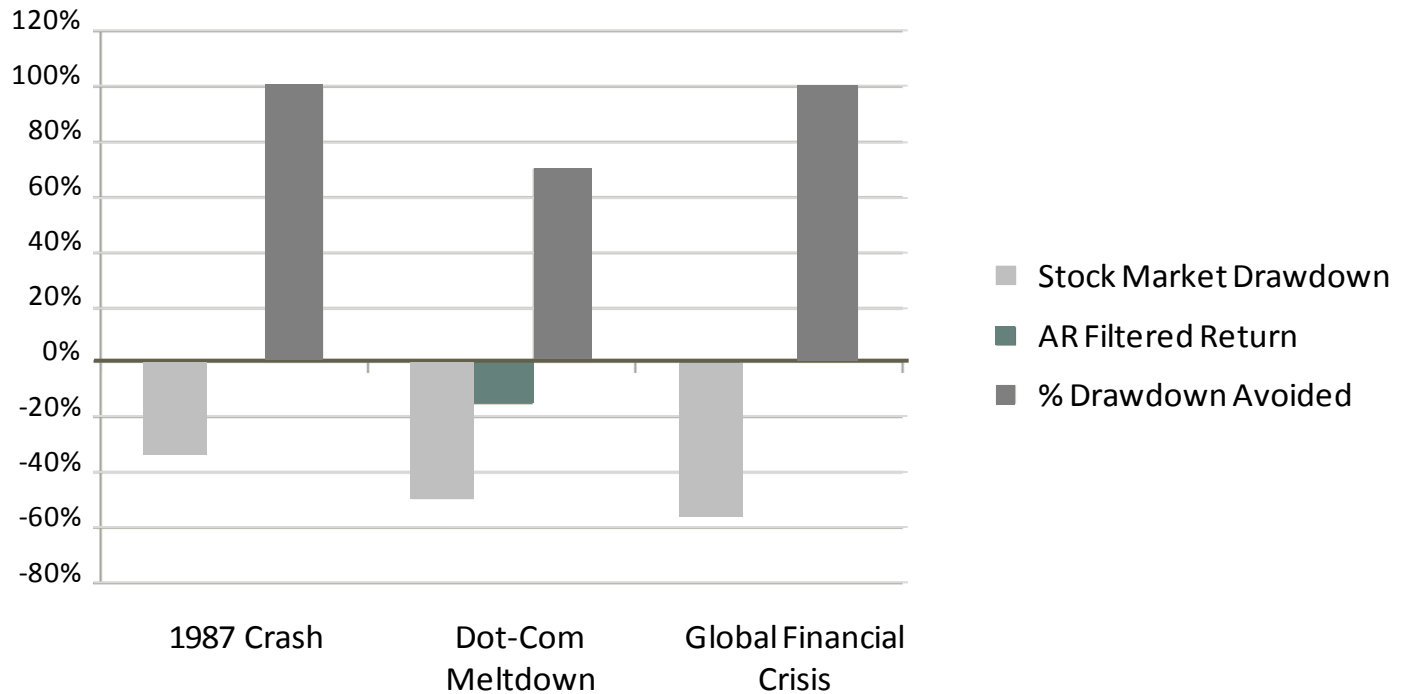
\* Date Range: January 1998 through January 2010

\*Kritzman, Mark, Yuanzhen Li, Sebastien Page, and Roberto Rigobon, "Principal Components as a Measure of Systemic Risk." *The Journal of Portfolio Management* (Summer 2011).



## RISK MEASURES – SYSTEMIC RISK

### Systemic risk and major stock market crashes\*

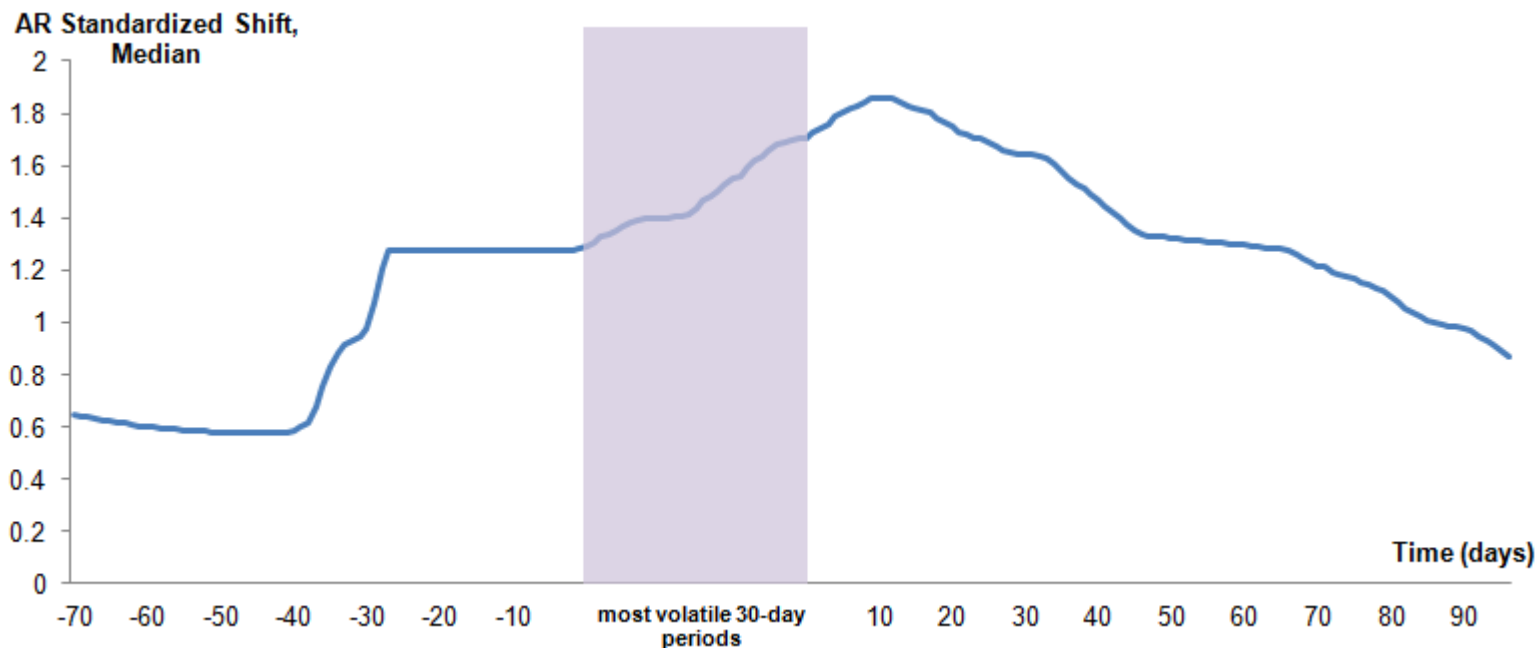


\*Kritzman, Mark, Yuanzhen Li, Sebastien Page, and Roberto Rigobon, "Principal Components as a Measure of Systemic Risk." *The Journal of Portfolio Management* (Summer 2011).

**Note:** Based on simulated data.



## RISK MEASURES – SYSTEMIC RISK

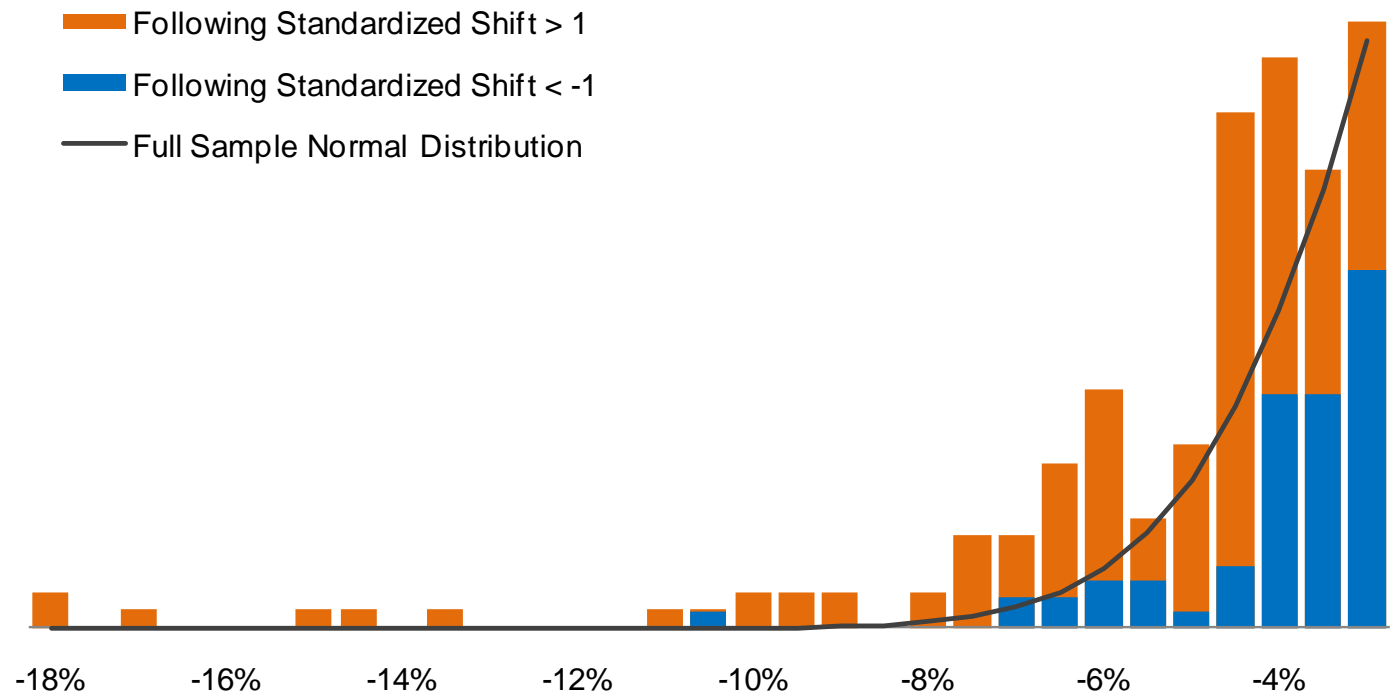


We identify the 10% most volatile 30-day periods of the MSCI All Country World Equity Index. We synchronize the volatile periods and measure the median standardized shift of the global absorption ratio leading up to, during, and following these periods of volatility.





# RISK MEASURES – SYSTEMIC RISK





# RISK REGIME INVESTING™ – 6 “STATES OF RISK”

Risk Regime	Fragile Market <i>(High Systemic Risk)</i>			Resilient Market <i>(Low Systemic Risk)</i>		
	<i>High Turbulence</i>	<i>Moderate Turbulence</i>	<i>Low Turbulence</i>	<i>High Turbulence</i>	<i>Moderate Turbulence</i>	<i>Low Turbulence</i>
Risk Relative to Benchmark	Maximum Underweight	Underweight	Small Underweight	Underweight	Small Overweight	Maximum Overweight
Regime Description	Fragile market, unusual behavior of asset prices and correlations	Fragile market, moderate turbulence	Fragile but calm market	Resilient market, unusual behavior of asset prices and correlations	Resilient market, moderate turbulence	Resilient and calm market



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