USING THE S&P 500 & TREASURIES TO MANAGE RISK – RETURN TRADE-OFFS

…And Deal with Black Swan Events

Joe Benning

Hypothesis: Market pricing is so efficient that it is virtually impossible to outperform the Broader Market.

- Market Prices incorporate all relevant information
- Changes in Market Prices result from changes in relevant information
- The process (discounting) is almost instantaneous
- In the short-term market pricing is a random walk
- In the long term, investors can expect positive returns
- Market timing and security selection strategies are attempts to outperform or "beat the market" adjusted for risk
- Why try to outperform the market when it is virtually impossible to succeed?

Active Management vs. Indexing

MARKETS BUSINESS INVESTING TECH POLITICS CNBC TV

Active fund managers trail the S&P 500 for the ninth year in a row in triumph for indexing

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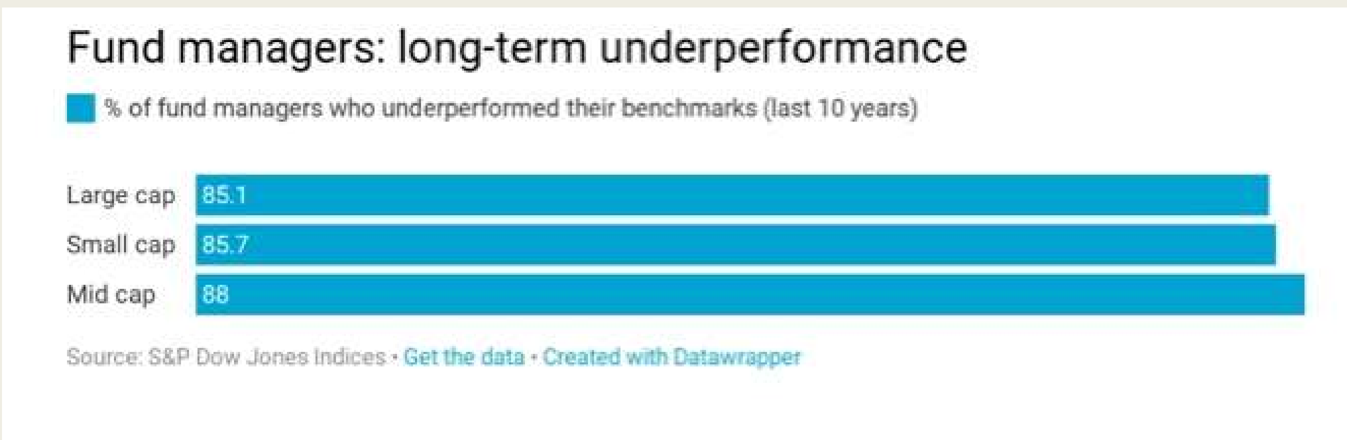

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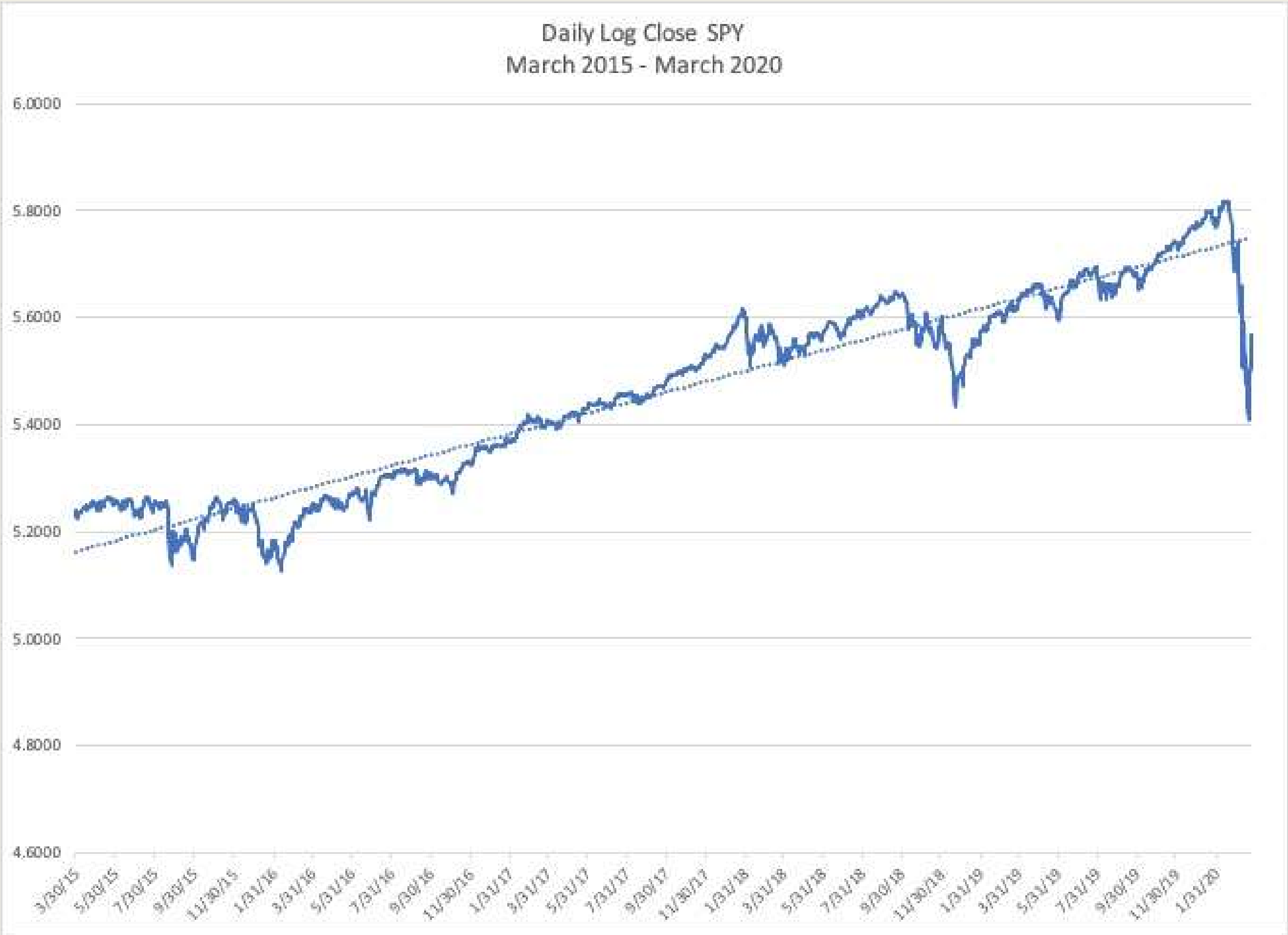
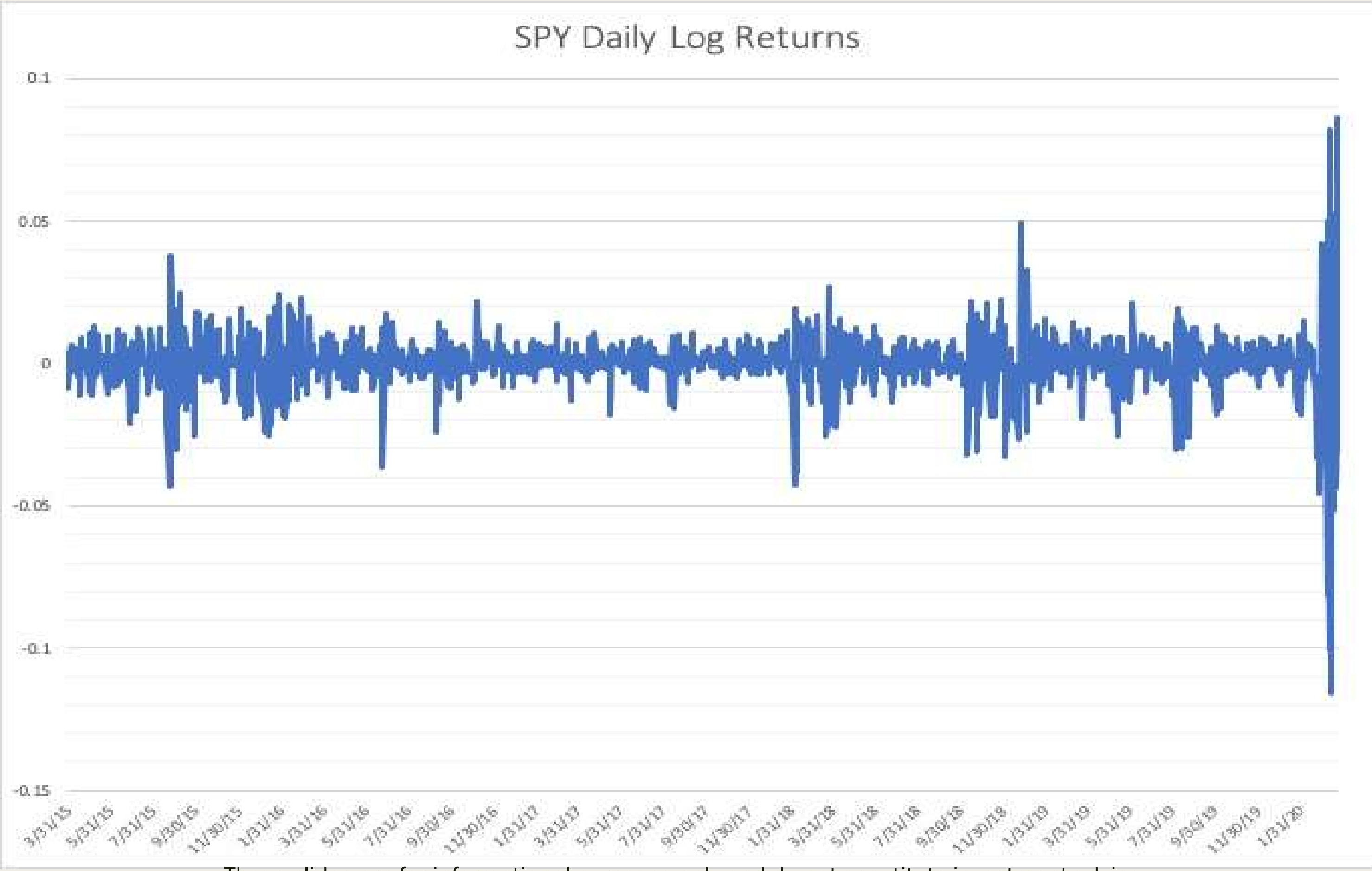
Daily Closing Log Prices SPY March 2015 – March 2020

Source: Yahoo Finance



Time Series Daily Log Returns: March 2015 – March 2020

Source: Yahoo Finance



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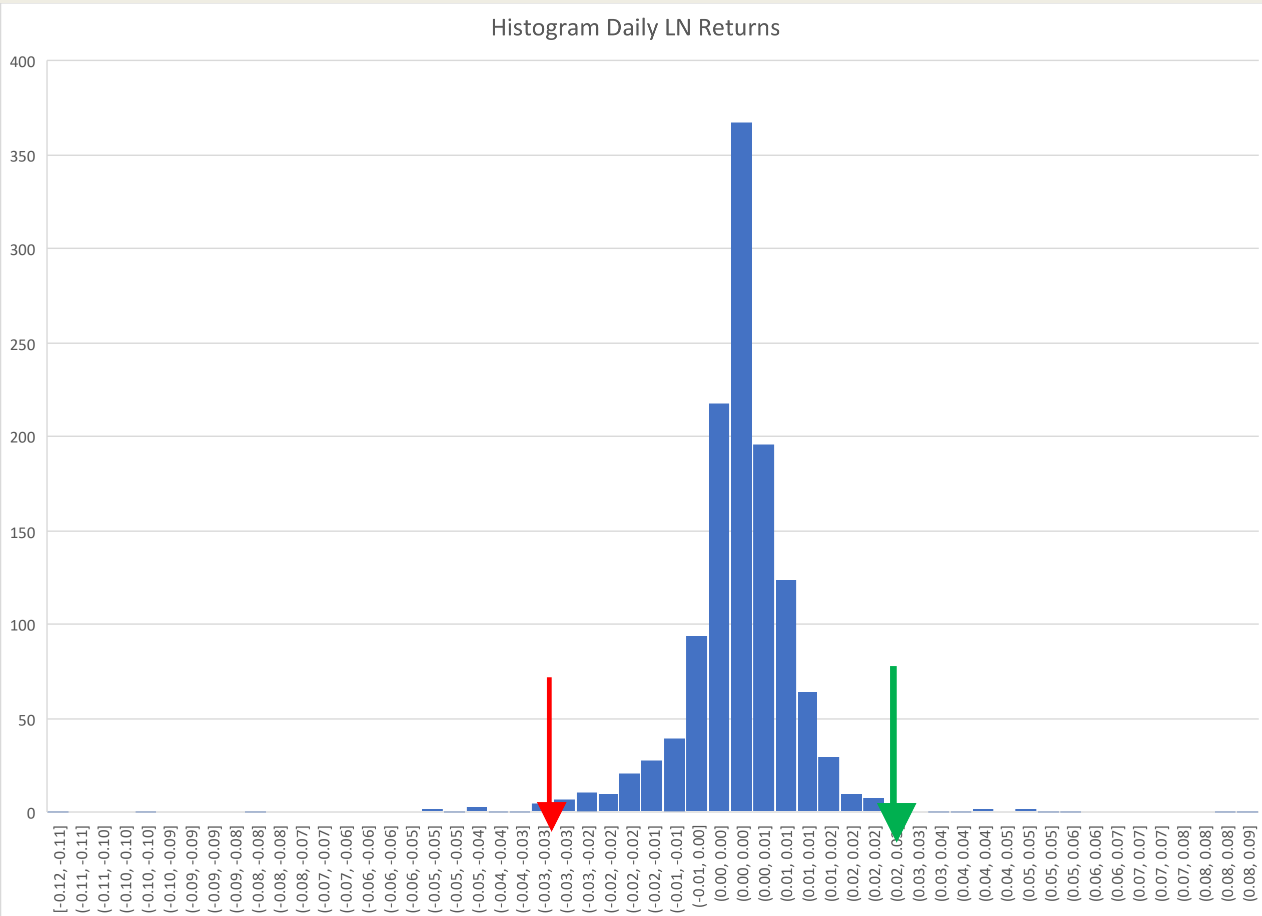
Histogram Daily Log Returns--Return of the Black Swan

Source: Yahoo Finance



Some Statistics

Count	1258
Median	0.00051419
Mean	0.00021473
Min	-0.1158941
Max	0.08673101
Std Dev	0.01112816
3σ	0.03338447
MIN	-10.414492
MAX	7.79383427

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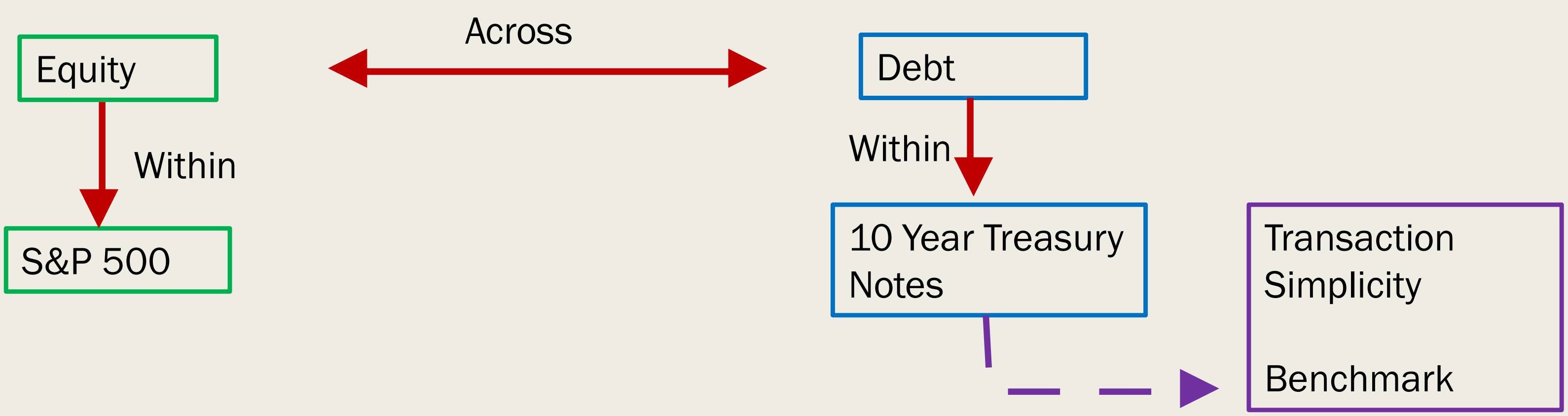
What do the Graphs Suggest?

- Short term returns are highly variable; they are randomly distributed
- Because they are randomly distributed, short term returns are not predictable
- Therefore <u>both</u> market timing <u>and</u> stock selection strategies are doomed to failure—
  - If success is defined as achieving superior risk adjusted returns
  - If it isn’t, why bother?
- In the long term, investors should be confident of enjoying positive risk adjusted returns
- They keys to positive long-term returns are (1) effective Portfolio Diversification and (2) disciplined Asset Allocation

The optimal strategy is diversification both within and across asset classes

Assume 2 Asset Classes: Equity and Debt



Why Use SPY and Treasury 10-Year Notes as Instruments?

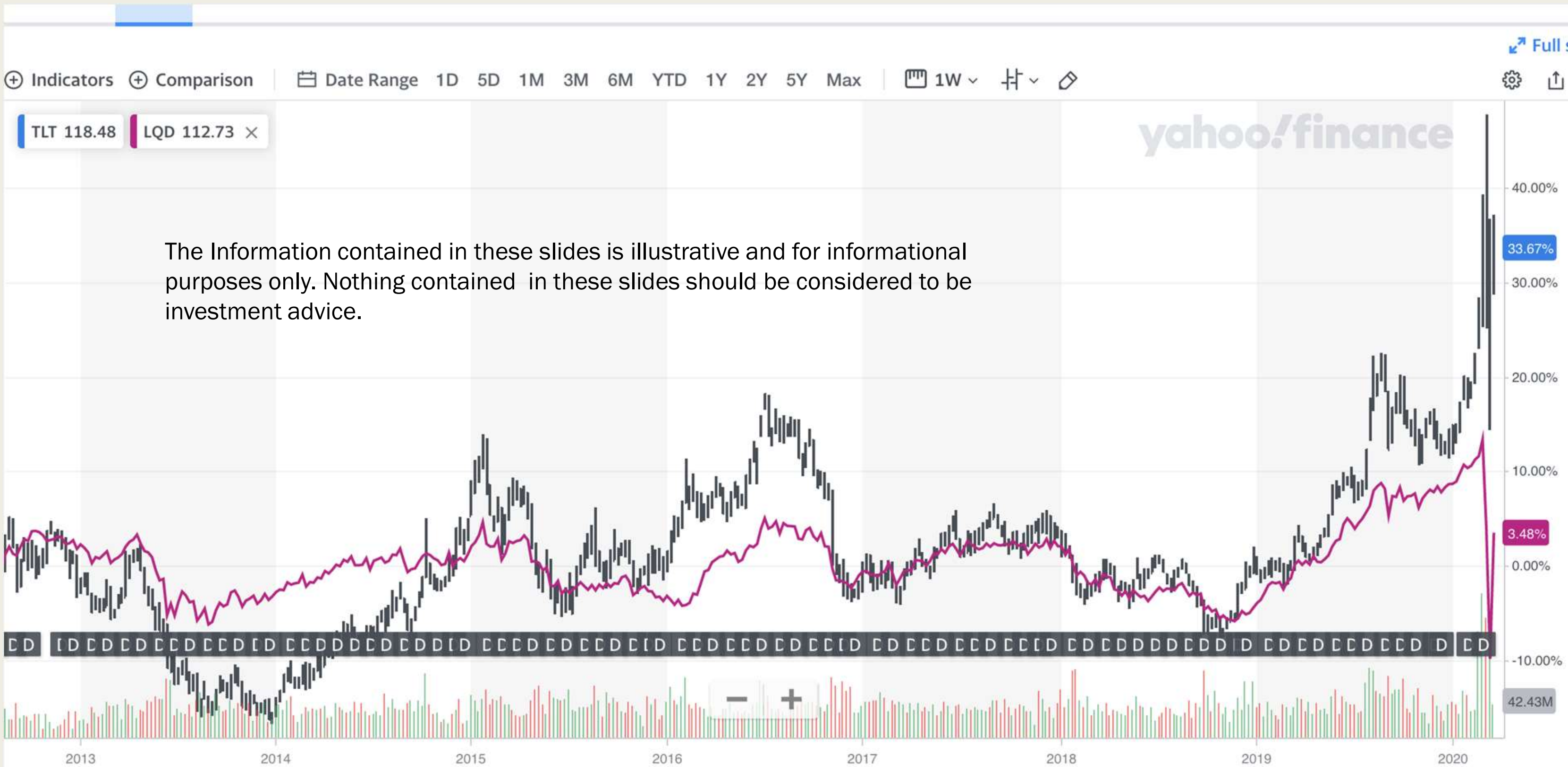
Equities

- SPY replicates the S&P 500 extremely well
- The S&P 500 is the industry benchmark
- It is very liquid & tax efficient
- Very low costs due to scale ~ 4 to 5 basis points for management fees

Debt Securities

- Treasury securities are the highest-quality assets
- 10 Year is a bond market benchmark
- Extremely liquid
- Exempt from State and Local Taxes
- Cash Treasuries can be used to “ride down” the yield curve
- Credit securities (corporate and muni bonds) are (1) priced at a spread to Treasuries and (2) subject to credit shocks
- Corporates may become correlated with the underlying equity, thus reducing diversification benefits—for instance in a credit squeeze

Treasuries vs Corporates During Stressed Market Conditions: TLT v LQD. Source: Yahoo Finance



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Times of Market Stress – Financial Crisis of 2008 & COVID -19 of 2020

Source: Yahoo Finance

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Hypothetical Diversified Portfolio with Different Asset Allocations

Hypothetical: For Illustrative Purposes Only									
Equity Portfolio %	**Equity Portfolio (Exp) Returns**	**Debt Portfolio %**	**Debt Portfolio (Exp) Returns**	**(Exp) Portfolio Mean Return ∝**	**Portfolio STD DEV σ**	**1 σ**		**2 σ**	
80%	6%	20%	2%	5.20%	15%	-10%	20%	-25%	35%
60%	6%	40%	2%	4.40%	12%	-8%	16%	-20%	28%
50%	6%	50%	2%	4.00%	9%	-5%	13%	-14%	22%
40%	6%	60%	2%	3.60%	7%	-3%	11%	-10%	18%
20%	6%	80%	2%	2.80%	5%	-2%	8%	-7%	13%

Summary: Portfolio Diversification & Asset Allocation Strategies

- Allows investors to choose a *quantifiable* risk – return profile
  - Risk – Return return trade-offs are explicit
- Reduced transaction costs & tax efficiency
- Can provide insurance during Black Swan events

But, It requires…

- Some mathematical sophistication
- Discipline
- And a long-term outlook

Market Efficiency, Asset Allocation and Fat-Tails, AKA Black Swan Events

Discussion