SEPTEMBER 1, 2015

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Improve Returns by Conquering Behavioral Biases

2015 Client Summit

True North

Decisions matter

Investing is decision making

— Every investor is presented with the same capital markets.

— Every investor is presented with roughly the same tools.

— Every investor is presented with infinite information.

What distinguishes successful investors from unsuccessful ones is one simple thing – their decision making ability.

Our goals

We want to understand

—How to decide

—What to decide

—How to know when we succeeded

—How to get better at the process of investing

The problem is the common factor.

What is that common factor?

This is the common factor

And of course this is not simply the common factor, but it's also the problem that we face

Strengths and weaknesses

STRENGTHS	WEAKNESSES
— Judgement	— But not always
— Insight	— But not always
— Can grasp the whole picture	— But not always
— Defining the problem	— But not always
— Gut feel	— But not always
— Hedonic calculation ability	— But not always

So why do it?

But this is the alternative

We don't want the reign of the tyrannical robots

Source: Wikimedia Commons, D J Shin, Creative Commons license

So that gives us four problems

— Math is hard

— People are odd

— You only get one chance

— Squirrel!

Math is hard

Math is hard…

—Over-reliance on technical tools

—Experts vs Priests

—The danger of over-precision

—Everything looks like a nail

Over-reliance on technical tools

Gaussian copula [edit]

The Gaussian copula is a distribution over the unit cube $[0,1]^d$. It is constructed from a multivariate normal distribution over $\mathbb{R}^d$ by using the probability integral transform.

For a given correlation matrix $R \in \mathbb{R}^{d\times d}$, the Gaussian copula with parameter matrix R can be written as

$$C_R^{\text{Gauss}}(u) = \Phi_R\left(\Phi^{-1}(u_1), \ldots, \Phi^{-1}(u_d)\right),$$

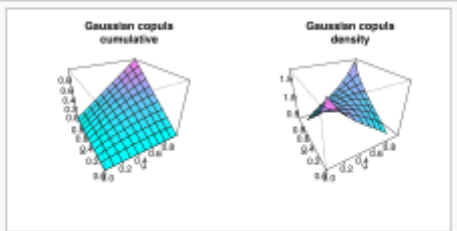
where Φ^{-1} is the inverse cumulative distribution function of a standard normal and Φ_R is the joint cumulative distribution function of a multivariate normal distribution with mean vector zero and covariance matrix equal to the correlation matrix R.

The density can be written as[4]

$$c_R^{\text{Gauss}}(u) = \frac{1}{\sqrt{\det R}} \exp\left(-\frac{1}{2}\begin{pmatrix}\Phi^{-1}(u_1)\\ \vdots \\ \Phi^{-1}(u_d)\end{pmatrix}^T \cdot \left(R^{-1} - \mathbf{I}\right) \cdot \begin{pmatrix}\Phi^{-1}(u_1)\\ \vdots \\ \Phi^{-1}(u_d)\end{pmatrix}\right),$$

where $\mathbf{I}$ is the identity matrix.

Source: Wikipedia



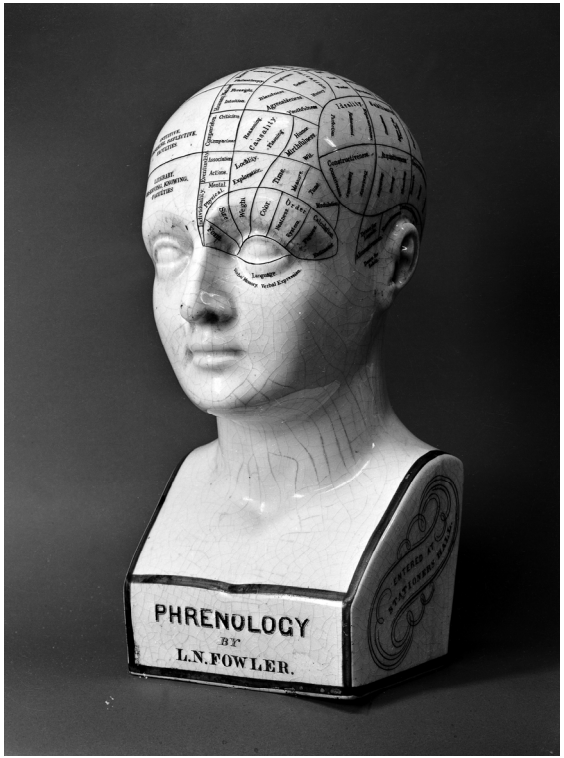
Cumulative and density distribution of Gaussian copula with $\rho = 0.4$

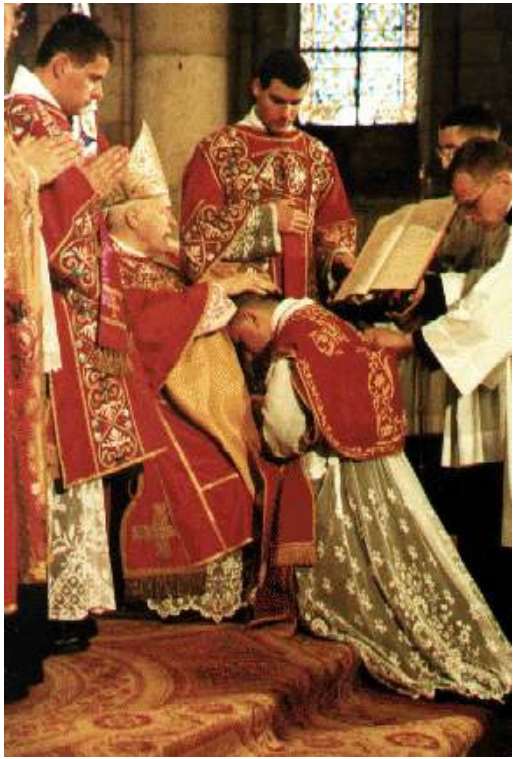
aka “The Formula That Killed Wall Street”

The progression of a technology

1. Inspiration
2. Edge
3. Standard
4. Legacy
5. Surprise

An ongoing conflict





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Approach with caution!

I’ve got this really cool hammer right here!

https://www.flickr.com/photos/21025851@N00/2168414155/in/photostream/

People are odd

People are complicated

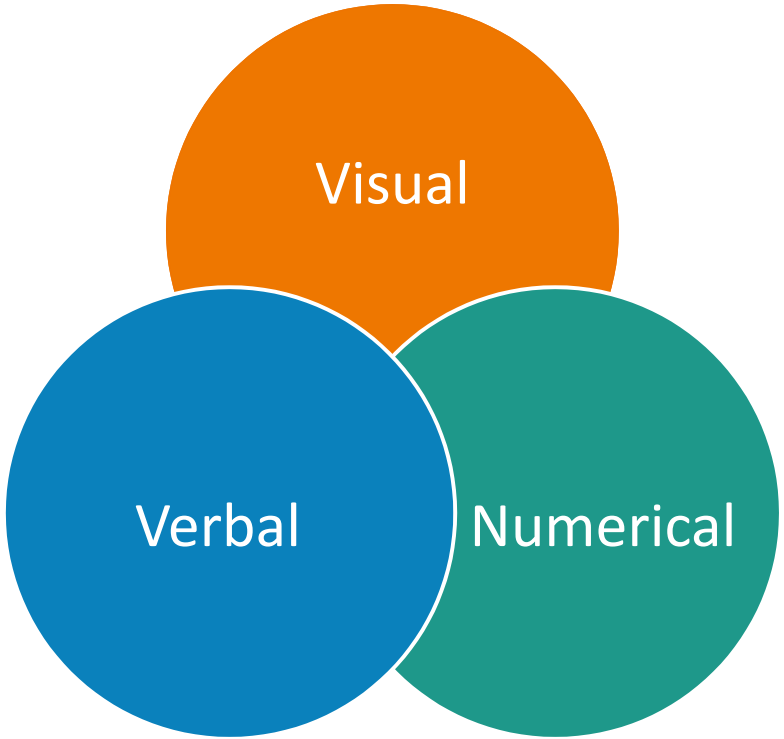
—Different types of people think in different ways

—Different types of thinking – fast and slow

—Comparing pleasure and pain

—“We’ve got a great idea” is more dangerous than “I’ve got a great idea”

Three styles of thinking



Different views – different insights

Fees paid vs. value received

Despite managers being able to generate excess return in many markets fees represent a significant cost.

- Certain fixed income marketplaces are particularly poor in this regard. While this represents the median manager, and therefore half of the managers will have provided higher excess returns, it seems clear that investors in active fixed income should be careful not to overpay for positive outcomes.
- The exact outcomes will be very manager dependent. However the importance of fees should be a major consideration for investors.

ASSET CLASS	COMMINGLED FUND FEE	MUTUAL FUND FEE	MEDIAN MANAGER EXCESS RETURN	EXCESS RETURNS NET OF COMMINGLED FUND FEES	EXCESS RETURNS NET OF MUTUAL FUND FEES
US Large	0.65	0.85	0.88	0.23	0.03
US Small	0.87	1.08	1.76	0.89	0.68
International Developed	0.76	0.96	1.02	0.26	0.06
International Developed Small	0.96	1.09	2.31	1.34	1.21
Emerging Markets	0.95	1.19	1.62	0.67	0.43
Cash	0.11	0.25	0.46	0.36	0.21
TIPS	0.21	0.47	0.11	(0.09)	(0.35)
US Treasury	0.50	0.46	-1.27	(1.77)	(1.73)
Global Sovereign	0.50	0.65	1.01	0.51	0.36
Core Fixed Income	0.53	0.54	0.51	0.18	(0.03)
IG Corp Credit	0.26	0.60	0.87	0.62	0.27
High Yield	0.62	0.73	-0.14	(0.76)	(0.87)
Global Credit	0.54	0.50	0.95	0.42	0.45
EM Debt Hard	0.65	0.79	1.12	0.47	0.33
EM Debt Local	0.73	0.86	-1.34	(2.07)	(2.20)
US REIT	0.67	0.92	1.45	0.79	0.54

Source: eVestment, 10 years ending 9/30/2014

Verus

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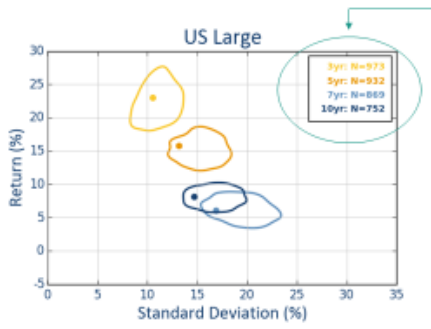
11

Tracking universes through time

Tracking the behavior of a single universe through time can provide insight into the way that active management has changed in that space over those time periods.

The movement of the universe, the change in shape and of size all provide information about active manager behavior.



The number of products included in the analysis provides insight into the robustness of the analysis.

The relative position of the benchmark relative to the universe may also change through time, representing dynamic structure changes through time.

Throughout this report each asset class universe chart is placed at the same position on the page, at the same size and with the scales of the axes identical. This allows for easy comparison between universes.

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7

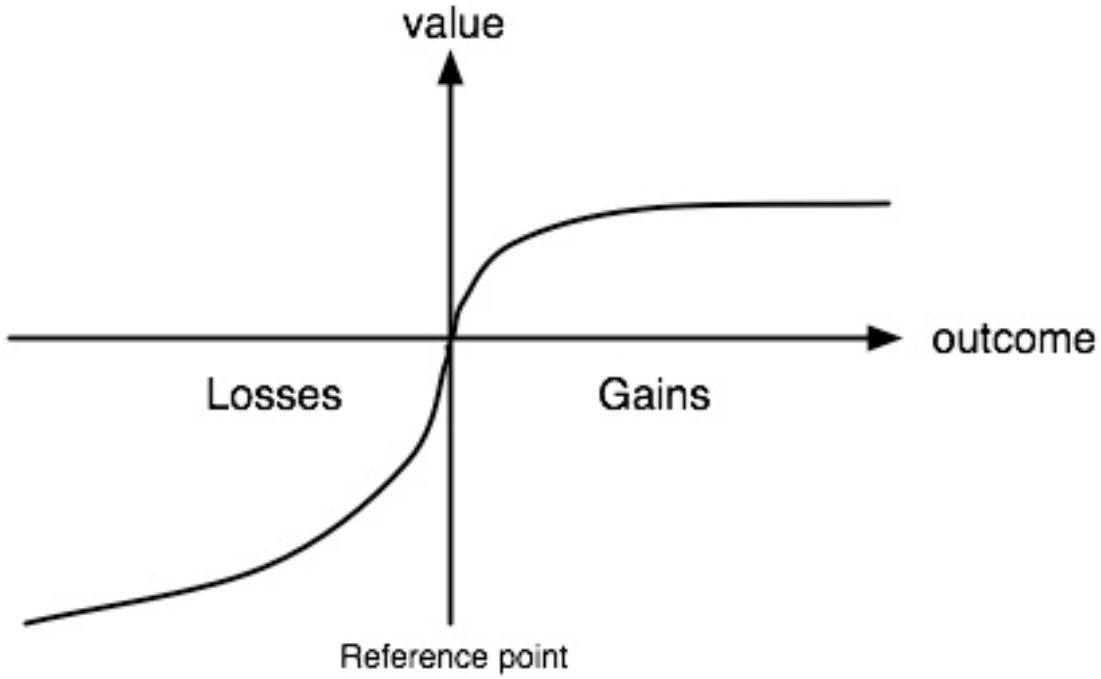
Thinking fast and slow

Our biology is very good at making sure we don't get eaten to death

It's not so good at making sure we don't eat ourselves to death…

https://commons.wikimedia.org/wiki/File:Snarling_lion.jpg https://upload.wikimedia.org/wikipedia/commons/7/70/DD-Boston-Cream-Donut.jpg

Pleasure & pain



This chart will be familiar to anyone who has ever been around a three year old child

Or indeed an institutional stockbroker

Obvious isn't

Oh… and never trust what you see even when it's on film

"Tunturisopuli Lemmus Lemmus". Licensed under Public Domain via Wikimedia Commons - https://commons.wikimedia.org/wiki/File:Tunturisopuli_Lemmus_Lemmus.jpg#/media/File:Tunturisopuli_Lemmus_Lemmus.jpg

You only get one chance

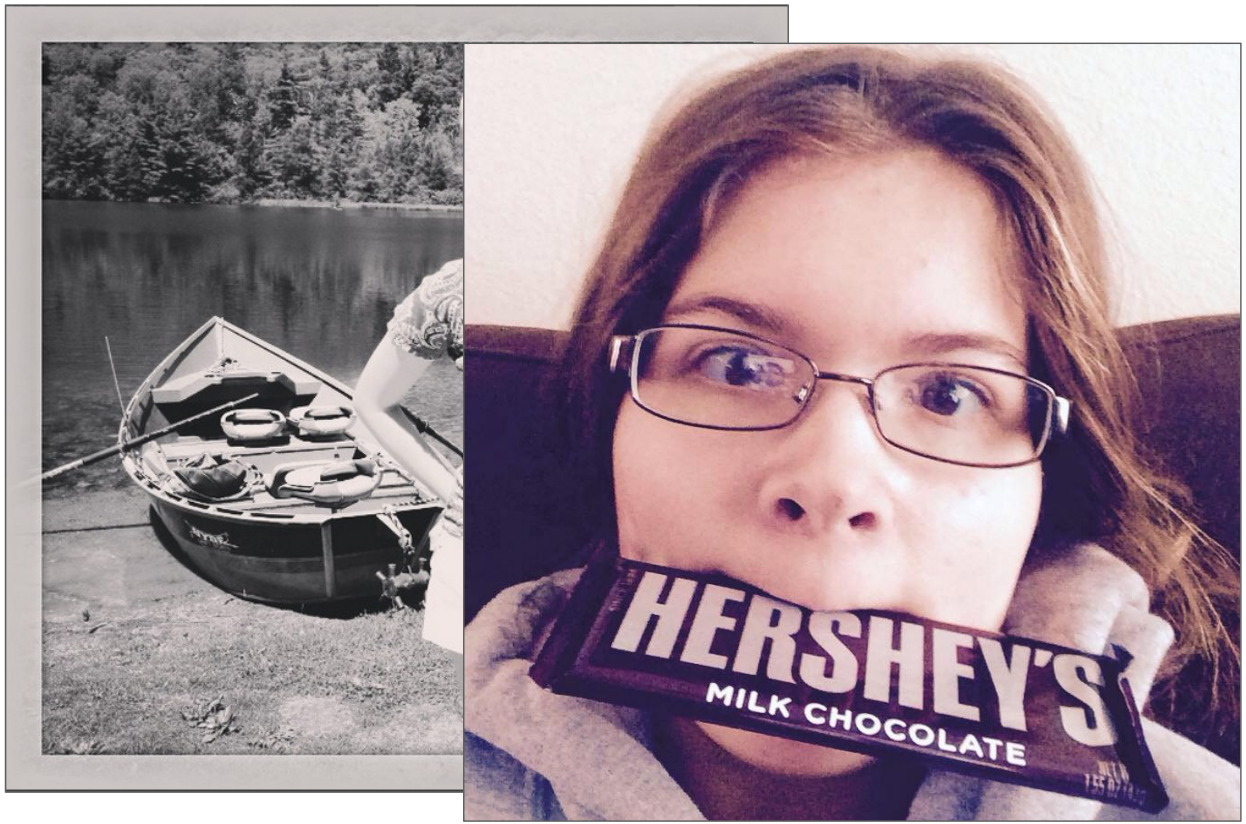
History only happens once

— The only thing worse than data is no data

— Stories are useful and dangerous

— What happens when you stare into the abyss and the abyss stares back

Remember data variability



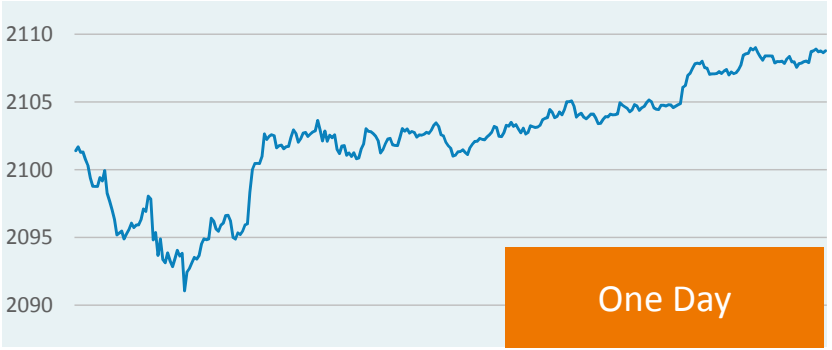
I
Have
Clearly
Failed
As
A
Parent

Time frame matters

The timeframe over which you observe data matters

But the nature of market data is to look very similar over multiple time periods

We want to be able to make sense of these. It's very easy to fool ourselves that we can make sense of them



Source: S&P

The danger of stories

— Tell me about your investment process…

— How do you make decisions?

— Talk me thorough a stock decision that you made that turned out well

— What do you do to understand and deal with errors?

— How do you see the firm developing through time?

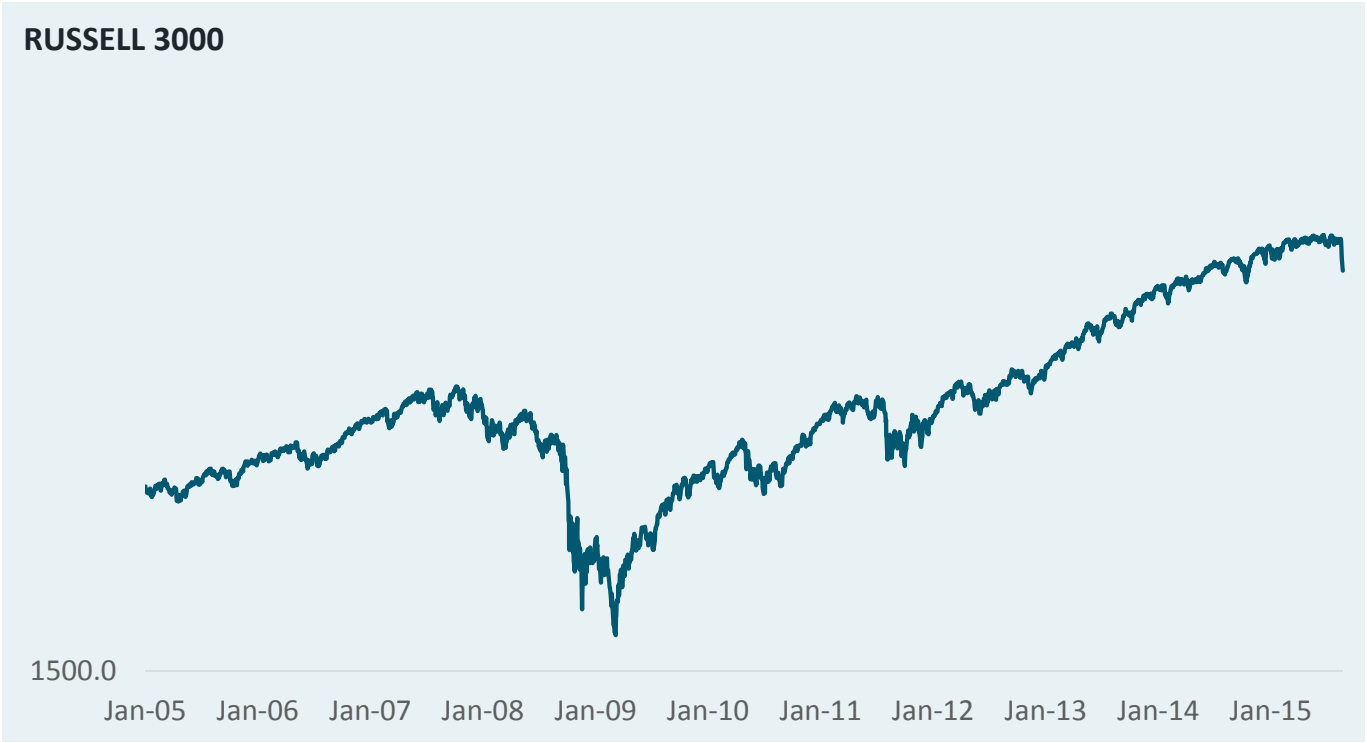
— What do you think is going to happen in the European Union over the next 5 years in the economic space?

— What's happening in the commodity market?

— Where are interest rates going, and when will it happen?

— Where do babies come from?

Staring into the abyss…



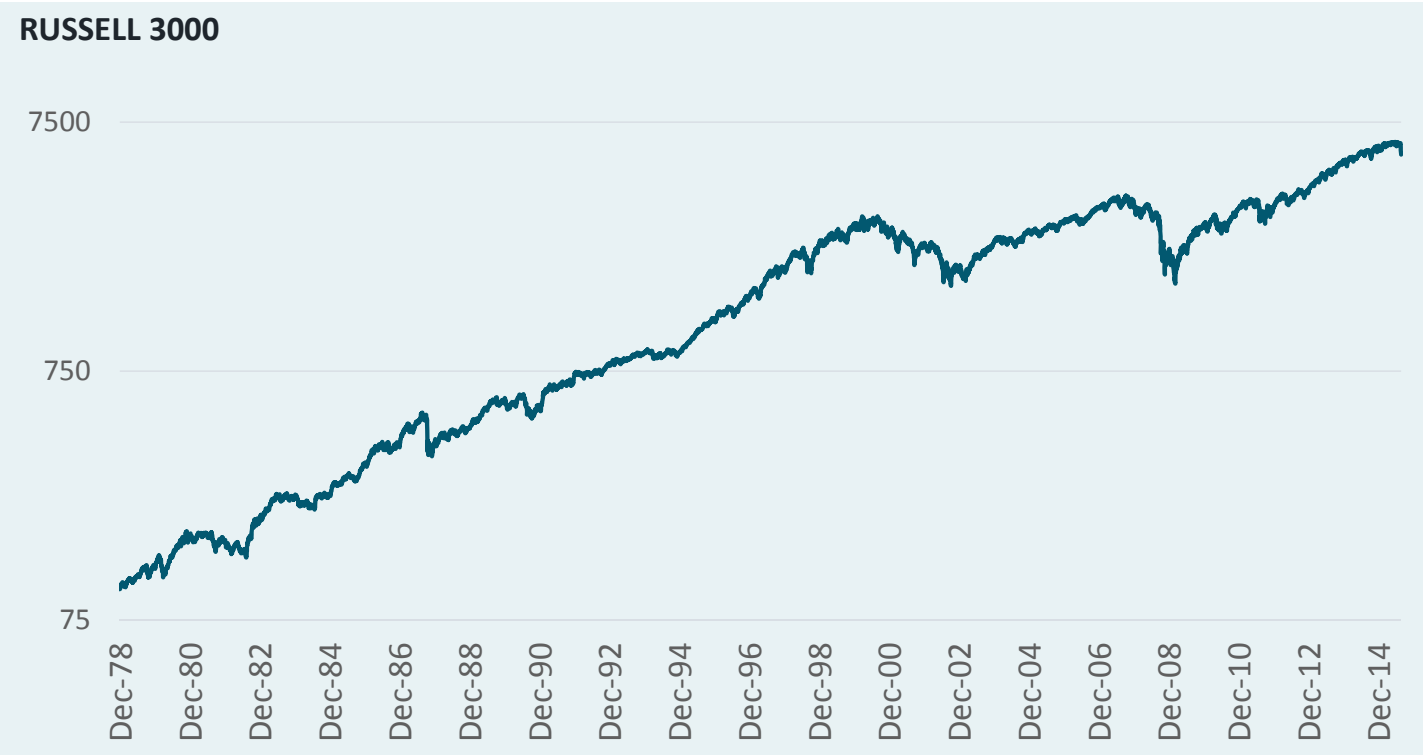
You can't ignore it

It distorts quantitative analysis that you might do

It affects qualitative analysis that you could do

It changes the way you think about risk at a very basic level

Context is all



Longer term history can help place things into context

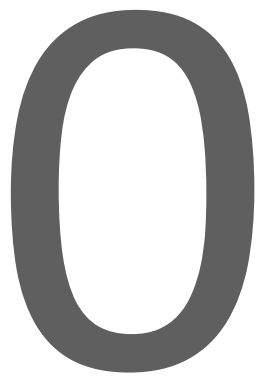
Source: FRED

The squirrel factor

A man who was known for his wit…

Source - Wikipedia

Starting from here



And keeping looking at it from all angles

Interesting ≠ useful

Embracing your inner nerd doesn't mean letting him run your life

Be very careful of the things that you find interesting

What are you missing in the boring stuff?

The truth is out there

I saw it on the news

It must be true

This slide has been redacted due to the fact that it contained information about [redacted]

Conclusions & thoughts

What to do

Remember that decision-making is a HUMAN process

— Sit down before making key decisions and discuss what biases you may be bringing to the table

— Make sure reporting and communication talks to all types of communication styles

— Make sure that the process of decision-making is driven by need, not news-flow

What to do

Remember that decision-making is a human PROCESS

— Find ways to build in behavioral understanding in the meeting by meeting process you follow

— Make sure reporting and assessment schedules are driven by the use to which the information will be put

— Pre-set clear goals and boundaries for success and failure – and refer to them later

Embrace embarrassment

Never leave a stupid question unasked

Thank you