

The Ultimate Uncertainty

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Major Points for Today

- ◆ Historical concepts of Uncertainty
- ◆ Characterizing levels of Uncertainty
- ◆ Distinguishing between Uncertainty and Risk
- ◆ Distributional Assumptions
- ◆ Changes of Regime
- ◆ Anticipated “News” – an oxymoron?
- ◆ Tools for Dealing with Uncertainty
- ◆ An empirical example: September 11

Concepts of Uncertainty

- ◆ The Fates
- ◆ Solon to Croesus: “Humans are creatures of pure chance”
- ◆ Predestination
- ◆ Bachelier
- ◆ Bayes

We need to distinguish between

- ◆ What we know
- ◆ What we think we know
- ◆ What we merely believe

Uncertainty and Risk

- ◆ The gift of a lottery ticket
- ◆ The despondent lover
- ◆ Risk is what we don't know that can hurt us
- ◆ Type 1 and Type 2 errors

Distributional Assumptions

- ◆ We routinely assume that events arise from a process with an identifiable probability distribution
- ◆ We routinely assume we know what distribution represents a particular process
- ◆ We routinely assume we know the parameters of these distributions

Changes of Regime

- ◆ Even if the course of events has been drawn from a particular distribution, the distribution is subject to change
- ◆ Finance is hand of man not hand of God
- ◆ Consider the Society of Dunkers

Anticipated “News”?

- ◆ Financial market participants act in response to new information... news
- ◆ Some news is completely unanticipated
- ◆ Most “news” is anticipated with respect to time but not with respect to content
 - Economic announcements
 - Corporate earnings announcements

Response to “News”

- ◆ Market response to truly unanticipated events is slow
- ◆ Market response to anticipated events is extremely rapid
- ◆ Pre-announcement activity is predictable

Tools for Dealing with Uncertainty

- ◆ Bayesian statistics
 - Appropriately distinction between levels of belief
- ◆ Resampling
 - How uncertain are we about uncertainty?
- ◆ Flexible Factor methods
 - Catching the next big thing
- ◆ GARCH models
 - Useful but must be used with care
- ◆ Implied volatility

An interesting series of numbers

- ◆ 165, 148, 146, 149
- ◆ 156, 148, 92, 91, 98
- ◆ 156, 161, 191, 203, 138, 158, 154, 175
- ◆ 177

Make a portfolio

- ◆ 42 airline stocks traded in the US including major ADRs
- ◆ Market cap weighted
- ◆ Compute absolute volatility using our STM

The Short Term Model

- ◆ Take 250 trading days of returns for US stocks
- ◆ Correct for serial correlation and heteroscedasticity
- ◆ Estimate blind factors using iterated factor analysis
- ◆ Use implied volatility to adjust factor and specific variances

Levels of Asset Specific Risk

- ◆ 165 (8/10), 148 (8/17), 146 (8/24), 149 (8/31)
- ◆ 156 (9/4), 148 (9/5), 92 (9/6), 91(9/7), 98 (9/10)
- ◆ 161 (9/17), 191 (9/24), 203 (10/1), 138 (10/8), 158 (10/15), 154 (10/22), 175 (10/29)
- ◆ 177 (11/30)

More Numbers

- ◆ 9/10, 9/17, 11/30 Some Key Dates
- ◆ 589, 2755, 1145 Factor Variance
- ◆ 98, 161, 177 Specific Variance
- ◆ 26, 54, 35 Total Risk

A couple conclusions

- ◆ The tracking of implied volatility in the STM allowed for very rapid adjustment to conditions after September 11th
- ◆ The level of asset specific risk of our portfolio shows a large and abrupt decrease in the 3 trading days prior to September 11th

The Ultimate Uncertainty

- ◆ As participants in financial markets, the ultimate uncertainty lies in our ability rapidly adapt to changing conditions
- ◆ As human beings, we ought consider the words of John Ruskin