



Baylor University

Intro to *Business Risk Management*  
(FIN 4366)

Dr. James R. Garven

Financial Risk: Risk vs. Uncertainty

Financial Risk: Market Volatility (VIX)

# Introduction to *Options, Futures, and Other Derivatives* Finance 4366, Spring 2021

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## Risk versus Uncertainty

- Frank Knight (1921) defines risk as a quantity susceptible of measurement, and uncertainty as a form of risk that cannot be quantified.
- “Uncertainty must be taken in a sense radically distinct from the familiar notion of Risk, from which it has never been properly separated ... A measurable uncertainty, or ‘risk’ proper ... is so far different from an unmeasurable one that it is not in effect an uncertainty at all.”
- **Knighian uncertainty** is commonly referred to as “ambiguity”.
- In this course, we focus primarily on *risk* as defined by Professor Knight.



## Financial Risk: Market Volatility (VIX)

- A particularly useful measure of future short-term market volatility is VIX; VIX is the ticker symbol for the Chicago Board Options Exchange (CBOE) Volatility Index.
  - VIX is intended to measure the “implied” volatility of a “synthetic” at-the-money option on the S&P 500 index, with 30 days to expiration.
  - Thus, VIX represents a short-term (30-day) forecast (market consensus) of future stock market (S&P 500) volatility.
  - VIX is commonly referred to as a “fear” gauge, in that it proxies for investor risk aversion.
  - Higher (lower) VIX → higher (lower) risk aversion → higher (lower) cost of risk!



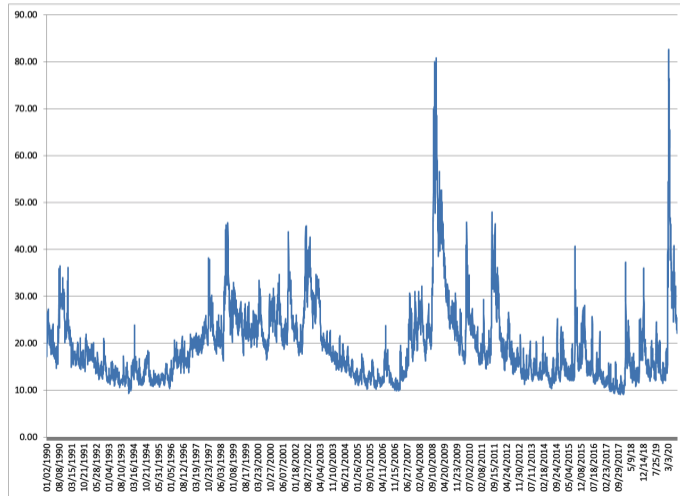
# VIX Time Series, 1/2/1990 - 8/10/2020 (n=7,712)

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## VIX Descriptive Statistics, 1/2/1990 - 8/10/2020 (n=7,712)

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No. of Observations	7,712	Date
Mean	19.39	
Standard Deviation	8.12	
Skewness	1.92	
Kurtosis	19.63	
Minimum	9.14	11/3/17
First Decile	11.97	
First Quartile	13.61	
Median	17.34	
Third Quartile	22.74	
Ninth Decile	28.88	
Maximum	82.69	3/16/20



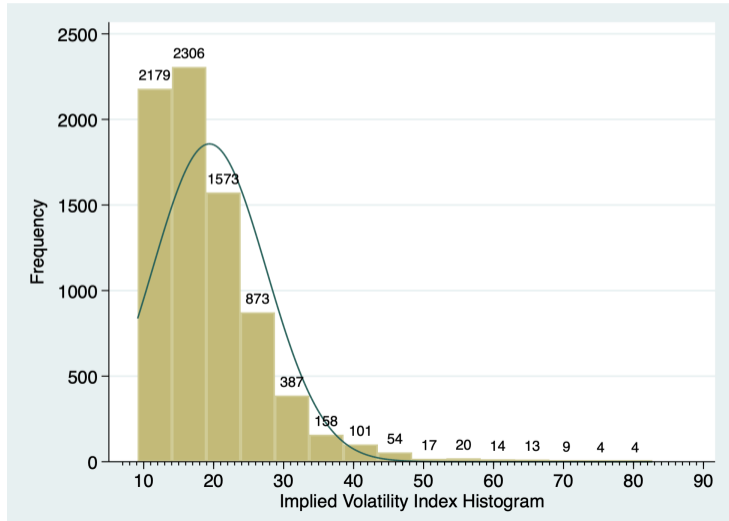
# VIX Histogram, 1/2/1990 - 8/10/2020 (n=7,712)

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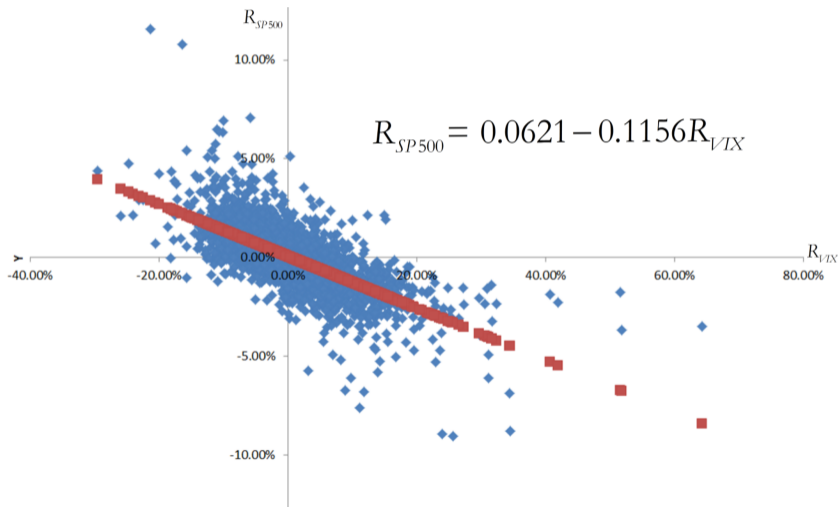
# SP500/VIX Daily Returns, 1/2/1990 - 8/10/2020 (n=7,712)

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See “On the relationship between the S&P 500 and the CBOE Volatility Index (VIX).”