



Baylor University

*Options, Futures, and
Other Derivatives*
(FIN 4366)

Dr. James R. Garven

Financial Risk: Risk
vs. Uncertainty

Financial Risk: Market
Volatility (VIX)

Options, Futures, and Other Derivatives

Finance 4366, Spring 2022

Dr. James R. Garven

Department of Finance, Insurance and Real Estate
Hankamer School of Business
Baylor University

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Risk versus Uncertainty

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- 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.”
- Today, “[Knightian 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)

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- 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!



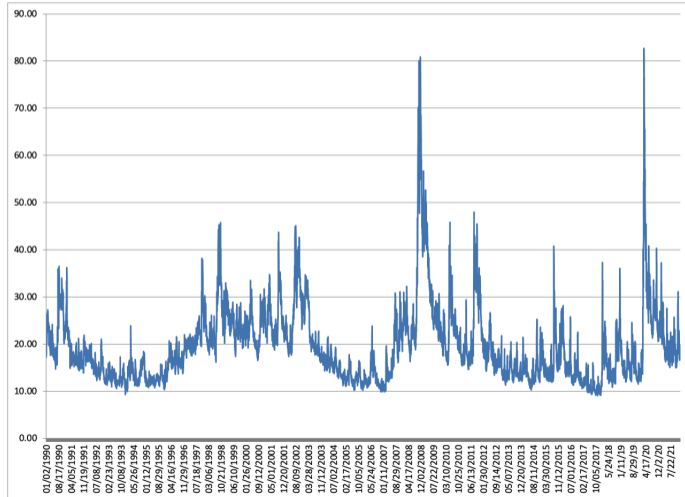
VIX Time Series, 1/2/1990 - 1/10/2022 (n=8,070)

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VIX Descriptive Statistics, 1/2/1990 - 1/10/2022 (n=8,070)

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No. of Observations	8,070	Date
Mean	19.48	
Standard Deviation	8.01	
Skewness	2.21	
Kurtosis	8.5	
Minimum	9.14	11/3/17
First Decile	12.01	
First Quartile	13.77	
Median	17.57	
Third Quartile	22.81	
Ninth Decile	28.75	
Maximum	82.69	3/16/20



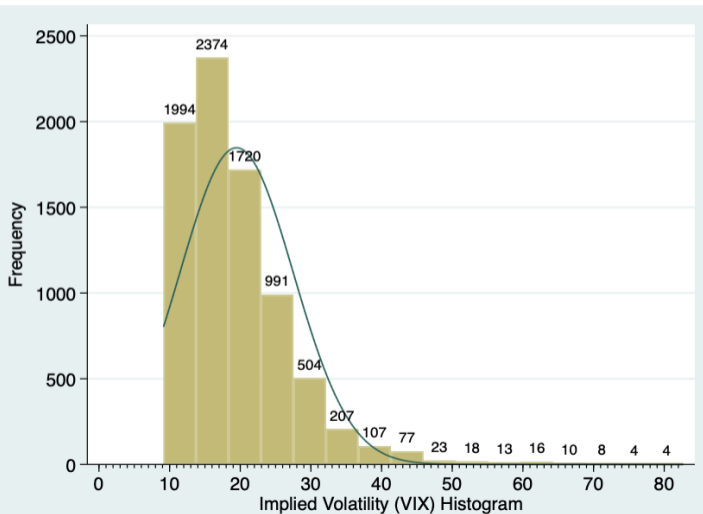
VIX Histogram, 1/2/1990 - 1/10/2022 (n=8,070)

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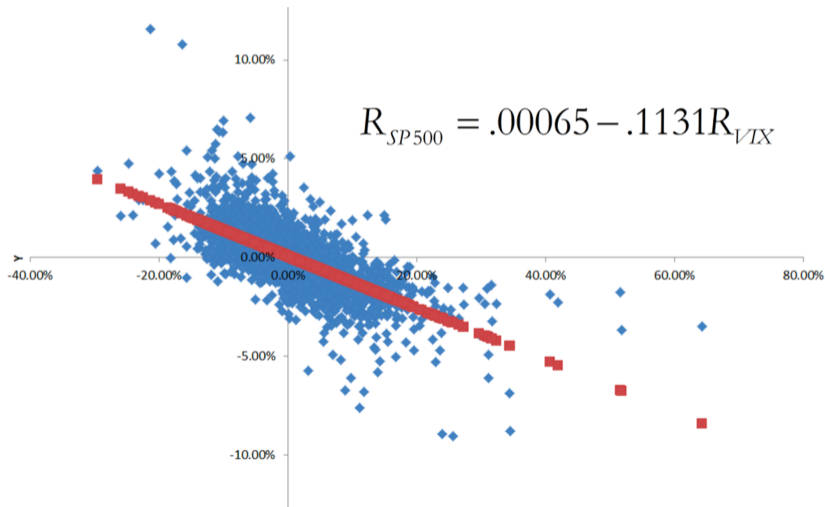
SP500/VIX Daily Returns, 1/2/1990 - 1/10/2022 (n=8,070)

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