

# A Tale of Wynn(ers) and Losers

*Applications of Risk Systems that Read®*

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# A Brief Overview

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- Quick review of relevant concepts
  - *Physics meets Finance*
  - *Conditional Risk Models*
- Motivation behind the work
- The concept of using quantified news flows to rapidly condition risk estimates
  - *Risk Systems that Read<sup>®</sup>*
- Application of the Theory
  - *Applying RSTR<sup>®</sup> to a real world example, The Wynn Story*

# Physics meets Finance

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- The analytical basis of the new approach is borrowed from “relativity” in physics. Differences in financial asset volatility over time are treated as a function of how quickly information is flowing to investors.
  - *When there is **intense** arrival of news, time itself is presumed to be passing quickly. When there is a little news of interest to investors about a particular company, sector or country, time itself is treated as passing slowly.*
  - We are treating time as endogenous. Rather than consider time as defined by minutes, hours or days, we define the passage of time in terms of news intensity, just as traders often think of time in terms of trading volume.
  - The intensity of news flow is a function of both the **frequency and the importance** of news articles.

# Physics meets Finance

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The easiest way to understand the process is to think of the volatility of a stock as being like a sine wave. The risk is the area under the curve. If the time scale is compressed the amplitude must increase. If the time scale is stretched, the amplitude must decrease



# Concepts of Conditional Risk Models

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- Almost all available risk models are “unconditional”.
  - They are based on a sample of past history that deemed relevant, possibly giving more weight to recent observations, or assuming a simple trend in volatility (e.g. GARCH)
  - Sample periods range from 60 days to more than 20 years.
  - Once the sample period is determined, the *heroic assumption is made that the future will be like the past.*
- This process omits everything we know about the present, and how the present is different from the past average conditions of the sample period.
  - Using the information about the present to adjust the risk estimates has been standard in some Northfield models since 1997, and in all models since 2009

# Some Motivation

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- The Global Financial Crisis of 2007-2009 demonstrated that the risk systems of financial institutions are frequently grossly inadequate.
  - The \$1.4 billion fine recently paid by Standard and Poors is yet another illustration of that inadequacy.
  - What is missing from nearly all financial models is a recognition of how the present is different from the past, and therefore, how the near future is also likely to be different from the past.
  - By defining “news” explicitly as the information set that informs us of how the present is different from the past, we can improve our estimates of near time horizon risk levels.
  - *Investors go to great effort to analyze financial news. It is bizarre that the estimation of security and portfolio risk should somehow ignore the information that investors give the greatest attention*

# A Definition of News

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- For our purposes, “News” is the set of information coming to investors that tell us how the present is different from the past.
  - This definition implies that routine information affirming the “status quo” is not news irrespective of how it is delivered. Investors respond differently to “announcements” (time of information release anticipated) than to “news” where both the content and timing are a surprise
  - Only a minority of large asset price moves are a direct response to investors responding to news. There are a lot of “information-less” trades (see Livnat, et. al. 2013). We need to be selective.
- It should be very intuitive that risk assessments should also respond to news

# Review of Previous Literature and Research

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- diBartolomeo, Warwick (2005)
  - Option implied volatility changes
- diBartolomeo, G. Mitra, L. Mitra (2009)
  - Followed the analytical structure of diBartolomeo and Warrick (2005)
  - Replaced option implied volatility with measures of quantified news flow and sentiment
  - Findings were that *news driven metrics were more efficient predictors of changes in volatility than metrics based on changes in option implied volatility*
  - We believe that news metrics work better than implied volatility because option markets have trading costs so the changes in implied volatility are muted compared changes in the beliefs of investors



# So, just counting news stories?

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- We define the speed of the passage of time by the intensity of news flow. It is a weighted count of news stories in a given period.
- The input metrics used to define the “weight” of a story are provided in real time by a “supervised machine learning” process provided by Alexandria Investment Technology based on text flowing through the Dow Jones news system. *Typically, we analyze over 5000 articles per day.*
- The weight assigned to a news story in the count depends on
  - Sentiment (good news, neutral, bad news)
  - Relevance (an article may mention several firms or topics)
  - Confidence (confidence interval on the sentiment score)
  - Classification of the subject matter (a story about a merger or accounting fraud will be more important than a routine dividend)

# Recognition of Time Decay

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- The process captures multiple aspects of time decay
  - How long ago did the news take place? For example, there may have been a spike in news volume three days ago which will still be important, but less important than if the spike in news volume occurred today.
  - How fast will investors notice the events? For high volume, liquid names the impact of news events will decay a lot faster for an obscure firm with no analyst coverage. *Different rates of time decay across stocks are based on liquidity levels estimated from the existing Northfield transaction cost model.*
  - Separately we consider the impact of time decay based on the forward risk horizon. For example, if we are trying to forecast intra-day volatility for tomorrow, an increase in news volume will have more impact than if we are trying to forecast average daily volatility over the next ten trading days.

# Separation of Factor and Specific Risk

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- While news can be aggregated simply at the country or sector level, sophisticated math is required to discover patterns of up or down news adjustments *across securities with common attributes*.
- diBartolomeo and Warrick (2005) shows how adjustments to the security volatilities can be “fed back” into the model to adjust factor variances and volatility estimates for stocks on which no options are traded
- If the model factors are not orthogonal you either use a non-linear optimization process or generate an orthogonal transform of the factors, estimate using OLS regression, and then translate the factors back to the original basis. See Shah (SSRN 2015) for details.

# Making Money with RSTR: Active Management

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- One of the key benefits of the new technique is that it allows for a positive definition of stock specific (idiosyncratic) risk.
  - In most risk models, the idiosyncratic risk of a stock is the standard deviation of the residual returns over time. **We are defining this very important item by what our model does not explain**, rather than by what our model does explain.
  - This is a crucial weakness for quantitative active managers, as standard alpha scaling techniques (Grinold, JPM, 1994) take stock specific risk as an input.
  - It should be intuitive that when investors perceive more risk, they are willing to pay less for a stock. When the risk is clearly related to news the result is even stronger. The most sophisticated analysis of the process was in Brown, Harlow and Tinic (*Journal of Financial Economics*, 1988).

# Wynn Resorts



- Applying Risk Systems That Read<sup>®</sup> to a very well known recent example, Wynn Resorts  
*Based on a Northfield essay "Why the Risk Systems That Read technology is so valuable –A Tale of Two WYNNers" available at: <http://www.northinfo.com/documents/797.pdf>*
- Risk forecasting based on Northfield Fundamental model
  - Long term model 1 year horizon
  - Near Horizon using RSTR<sup>®</sup> is 2 week forecast

# Wynn Resorts – Timeline – Earnings Report

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- On December 31, 2017 long term US Fundamental Model risk for WYNN was 38.44% per annum and priced at \$164.
  - 81.2% is stock specific
- January 2, 2018 the Risk Systems That Read® forecast for WYNN was 27.8%.
  - Lower risk number reflects recent generally low volatility of the market early 2018.
- January 18<sup>th</sup> WYNN moves up to \$180
  - The Risk Systems That Read® risk estimate moves from 28% to over 49% in a single day.
  - Typical behavior going into an earnings announcement as pre-announcement as press coverage becomes material
- January 22, Wynn announced better than expected fourth quarter earnings.
  - Many sell-side “buy” recommendations followed
  - Between the 18th and the 25th: A number of additional articles on Wynn, and the casino industry in general.
  - WYNN’s stock price rises from \$180 to \$200 over five trading days
  - The random likelihood of a move this big is about 1 in 60,000

# Wynn Resorts – Timeline – Scandal Hits

## Wynn Resorts stock price drops after Wall St. downgrade

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Some Wall Street analysts are downgrading shares of Wynn Resorts (WYNN) after CEO Steve Wynn was accused of sexual misconduct, which he denies.

Analysts at UBS changed their rating of the stock from "buy" to "neutral," citing allegations first reported Friday that Wynn harassed or assaulted a number of female employees.

"We believe risk to the outlook has increased as well, with recent allegations about the CEO prompting an investigation by the company's board as well as reviews by

BUSINESS DAY

### Stephen Wynn, Casino Mogul, Accused of Decades of Sexual Misconduct

By MATTHEW GOLDSTEIN, TIFFANY HSU and KENNETH P. VOGLER JAN. 26, 2018

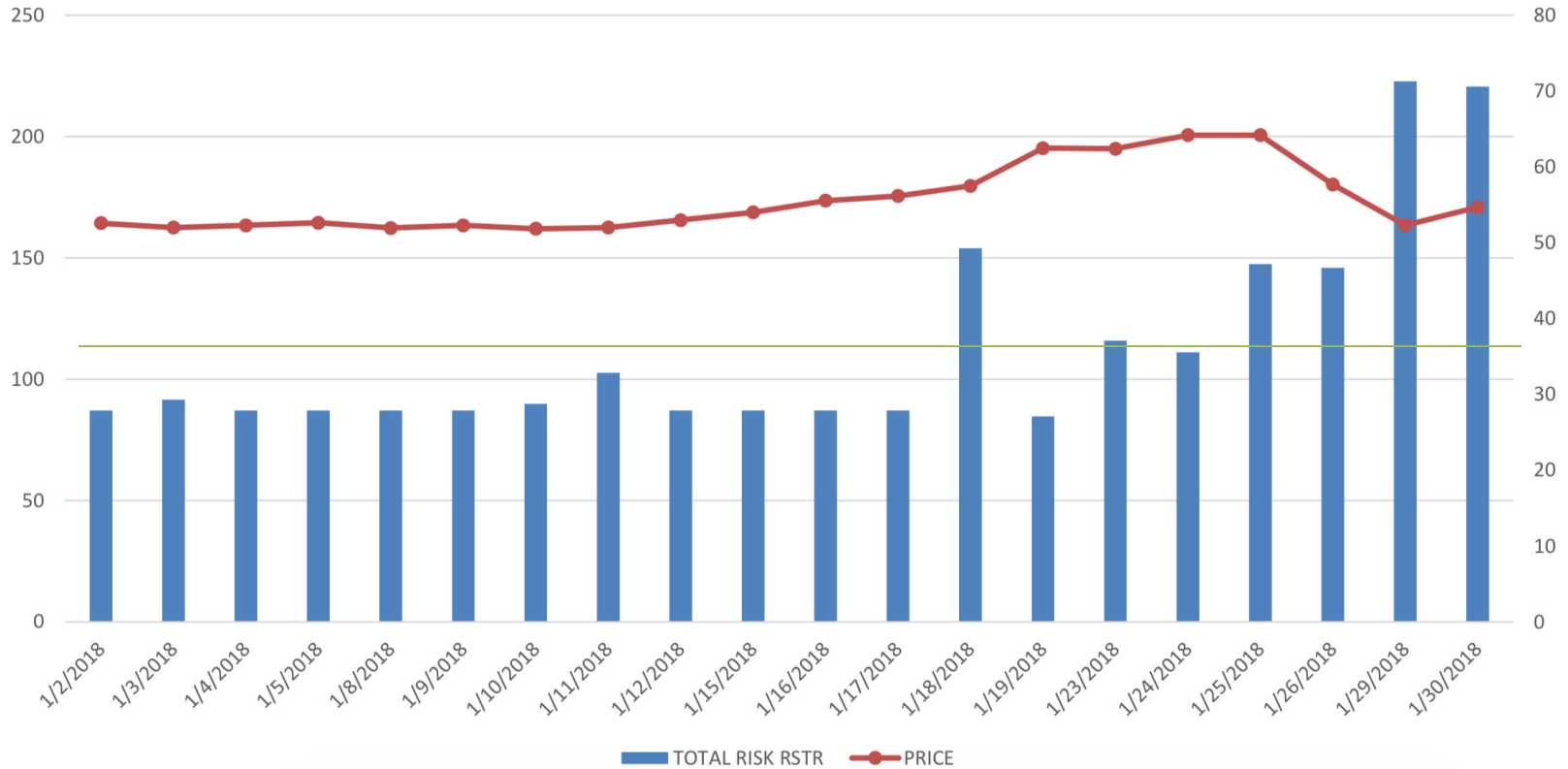


Stephen Wynn, chairman and chief executive of Wynn Resorts, with his wife, Andrea Hissom. Follow from the disclosure of allegations of sexual misconduct against Mr. Wynn mounted on Friday.  
\*Star: Wikimedia/CCO Beth Cook, via Getty Images

- Wynn's stock price falls from about \$200 on January 25th to about \$163 on January 29th
  - An 18% downward move in two trading days!!
- January 29th, adaptive model risk of Wynn is 70.5%
  - Due to the intense news coverage of the misconduct allegations
  - Nearly double the prior long-term estimate of 38.44%.
- Note: January 25th through January 30th, the S&P 500 market index is almost flat.

# Visualization of Event Timeline

WYNN January 2018





# Conclusions

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- Using contemporaneous market information outside the time-series provides a material improvement in near horizon risk estimation
- News matters to investors, incorporating an effective measure of news improves the accuracy of the risk estimate and explanation to stock specific risk
- WYNN Resorts provides a real world application on how Risk Systems That Read® responds to new information

*It is implausible that estimation of security and portfolio risk should somehow ignore this very obvious and elemental fact.*