Linear Regression Channels in Daily Market-Fluctuations

Analysis in isolated cases

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Overview

Daily Market fluctuations consist of mixed types of activity: decisive up/down runs, mixed up/down runs, chaotic runs and any reactive combinations of them. Within those variations, we will isolate relatively clean and clear linear up/down runs (LR) and make analysis of them. LR represent 10-70% of daily Market movements and understanding their footprint would define large portion of the overall Market activity.

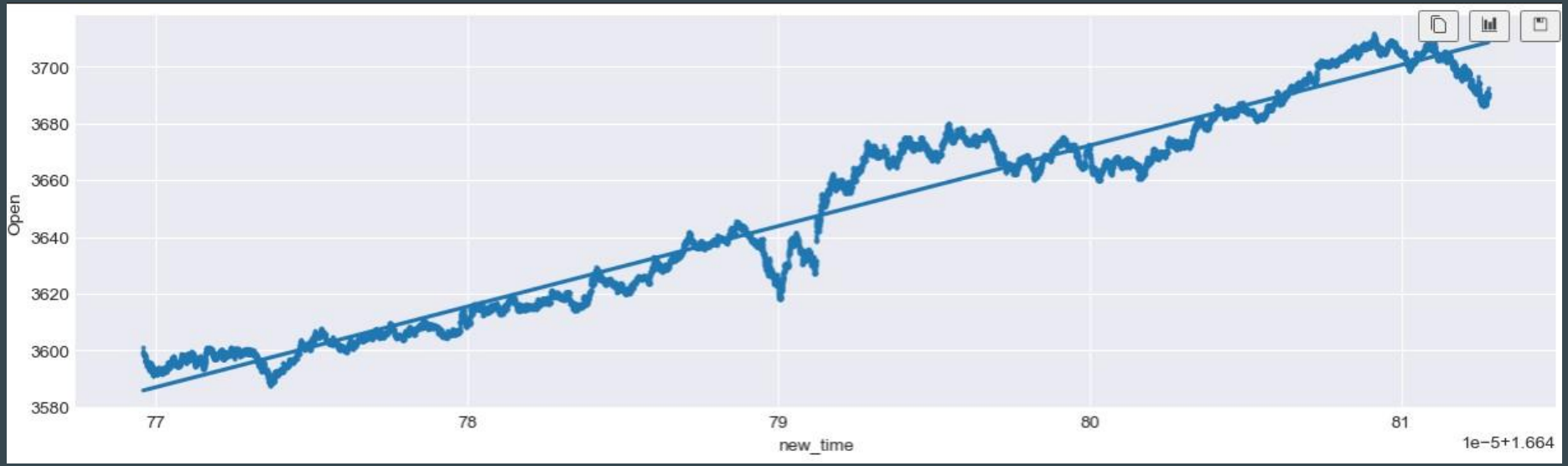
- What distinct differences in correlative features can be inferred from LR runs?
- Do positive/negative runs have specific discernible features vs 0 in proprietary oscillator?
- Possible derivatives that offer viable correlative chances for further exploration?

Correlations of BA Oscillator and SMA's vs isolated Marked LR

Define Slope of Regression line	Define specifics of LR footprint	Process few models and chose best
Slope to be defined programmatically in further explorations. Steeper Slope, according to which Price is predicted, model-wise, is described by Steeper Means (short, med, long). For further analysis: Add Time * Price as an Indicator (or variations)	Above and below 0 oscillations, synced to Market conditions, is a distinct footprint of LR. [LR is Linear Run- not Linear Regression]	TBC: Linear Regression ML Models, traditionally realtime, and even in isolated form, offer abysmally bad performance for daily Market trading predictions. Reversing strategies may offer, in certain Market conditions, better results. Contrarian approach proves better sometimes then traditionally "logical".

Project objective:
Finding discernable differences between Market LR (Up/Down Market fluctuations) and Oscillator BA and SMA’s.

Understanding the market



If we can know the slope and direction of a Linear Regression line - we can anticipate and stay within safe zone of Markets daily fluctuations. Is there another type of indicator(s) that may offer such directional bias like the line and slope, that can be inferred from real-time tick data?

Target audience

The finding of these notebooks should convey meaning in applications and audience made of:

Audience/Readers:

- Financial analysts
- Trading analysts
- Technically literate audience
- Developers

Market Linear-Regression type conditions findings:

Conclusion on BA oscillator:

Standardised BidAsk Means from 3, 5, 10 (short, mid, long) may offer subtle but reliable gauge for Market Disposition and

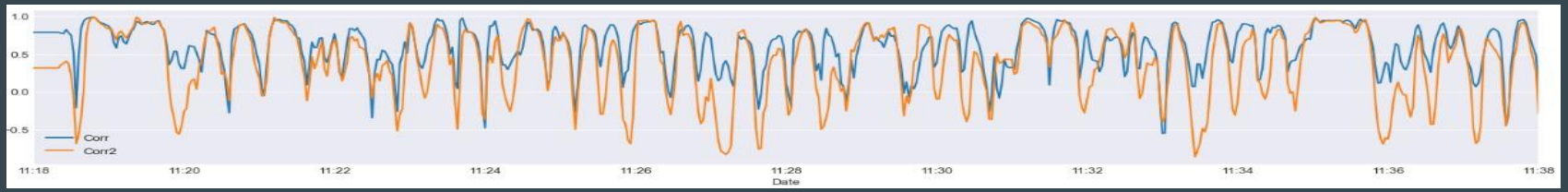
Up-Runs offer discernable above 0 bias presence.

Down-Runs offer discernable below 0 bias presence.

EDA

Findings:

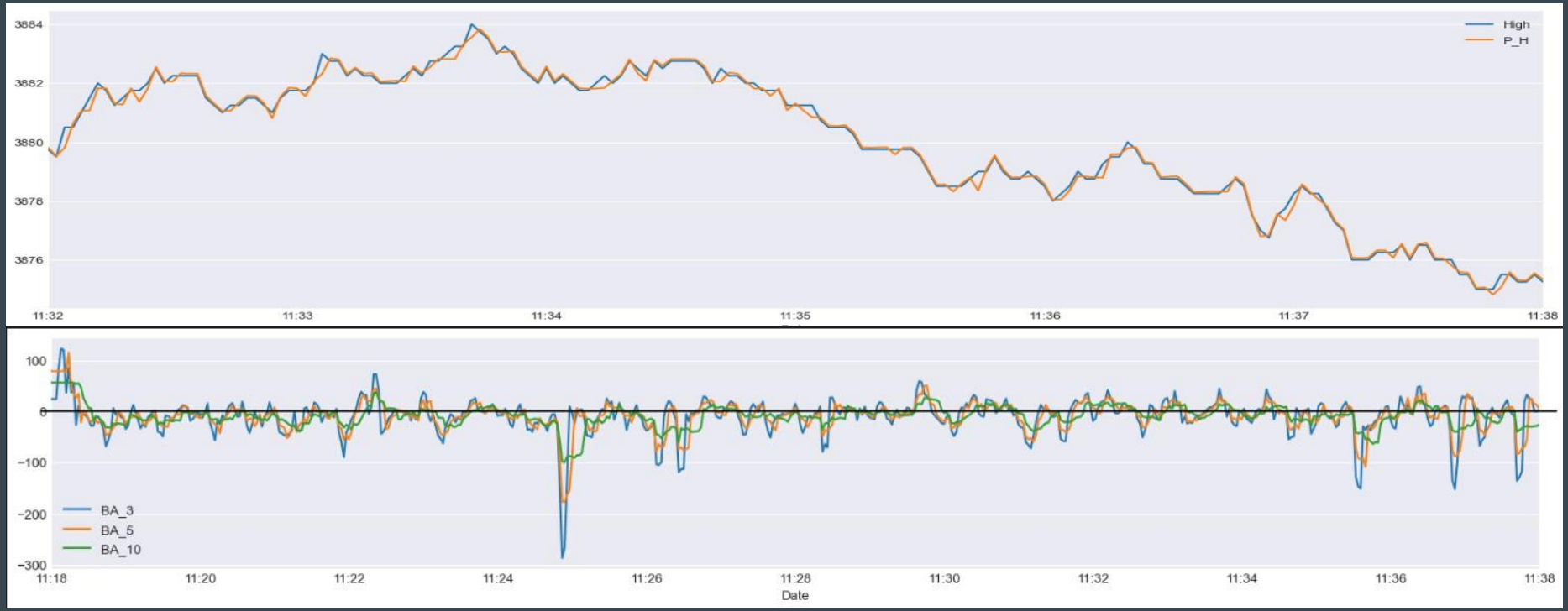
- Strong Corr between PriceMeans & Price- as expected



The preponderance of above 0 oscillations in this proprietary oscillator indicates strong correlation between Price and PriceMeans.

- Strong Corr between BA & Price. Prevalent above 0 presence of oscillator in Upward runs.

Down-run: Distinct below 0 presence of BA3, BA5, BA10 in oscillator, with Market showing strong downward tendency/direction. The big spykes, 1 upward, before the short upward run, and the large down spyke, before the downward run, may be strong ADDITIONAL indicators of impending change directions. This situation may be described by the literary: 'The exoteric reaction is only an outward projection of the inner already stated truths'.



TBD: Quantize a Ratio, reflecting the presence of BA's below/above 0, by adding a time factor and possibly volume and Stochastic Oscillator.

The Team

Tony Nikolas

Data Scientist

Part of the research for Story- an assignment on discovering aspects of inner interdependencies on dataset of interest.

Mentor

Ramkumar Hariharan
SpringBoard School- Data Science Department

Ramkumar Hariharan is a data scientist with Macro- eyes Health, working closely with the Gates Foundation, Seattle

NinjaTrader API

API from NinjaTrader written in ~~C#~~, exporting realtime time-series tick data, from Futures Market, CMO- Chicago

Python, Libraries

Python, Pandas, Numpy, Seaborn, Matplotlib, Pyplot, etc.