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PHASE BASED ECONOMICS

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Overview

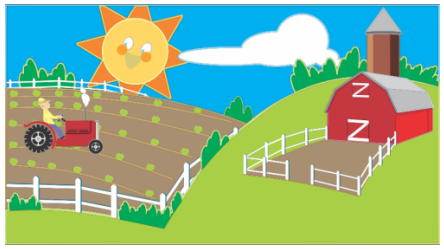
- Idea/Proposal
- Attempt at a proof of concept.
- Noticeable drawbacks
- Moving Forward/Hope for the Future

Idea

- Models fail because they assume independence
- Real world companies have interdependence
- Should lead to strong correlations along stock data
- Need models that effectively choose the right parameters to follow

Propose

- Specific company characteristics should invoke certain periodic trends in financial data.



- Current data is the running superposition of all these trends multiplied by a constant proportional to the correlation coefficient [r_ω]. Analogous from Elliot waves.
  - $|\phi(t)\rangle = \sum_\omega r_\omega \mathrm{Trig}(\omega,t)|\omega\rangle$
- Not all periodic trends of a system can be efficiently known
- “Elliot Waves” arise from uncertainty/error of projections

Propose: Refining

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- If two companies are strongly correlated, then we would expect that a shift in one of the frequency states of one company would lead to a similar shift in the other, following a short delay for the reaction timing.

- Assume if stock price gets too high (unstable), background Elliot waves with produce a crash.

- Whenever a “crash” occurs to a company, a negative Dirac function perturbation is applied to interdependent companies.

Propose: Refining

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- Use sampling statistics to establish various inter-company correlations of desired frequencies. (classical)
- Avoid high frequencies, since they require more samples for conclusive relationships.
- Since low frequencies required less samples, one should begin building the model at a lower bound. This allows one to quickly establish the long range relationships of a company with respect to time. The model can then continue iterating at smaller time-steps for increasingly more precise relations.

Crude Proof of Concept

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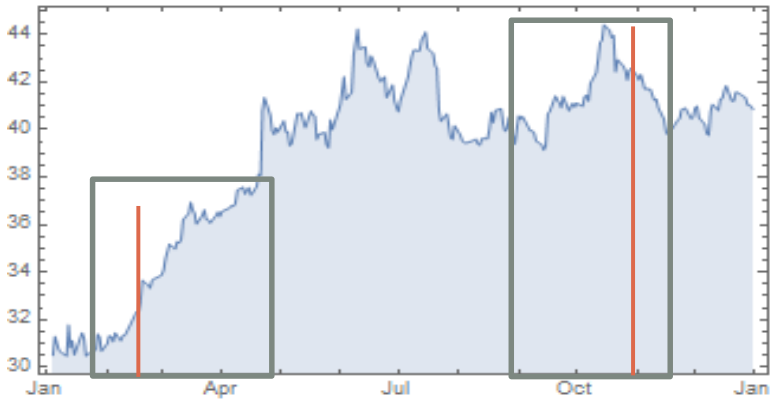
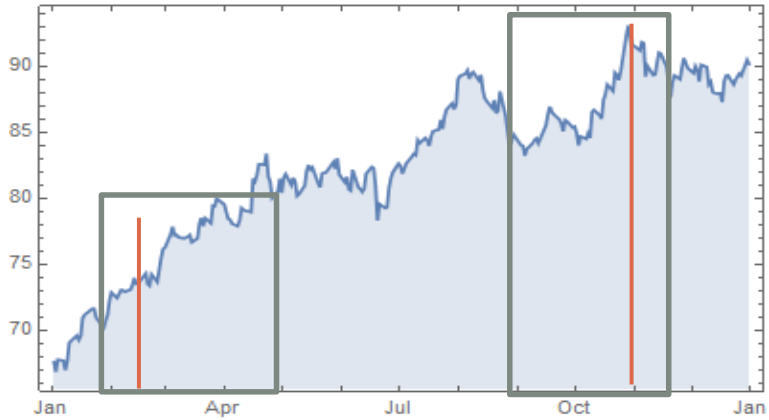
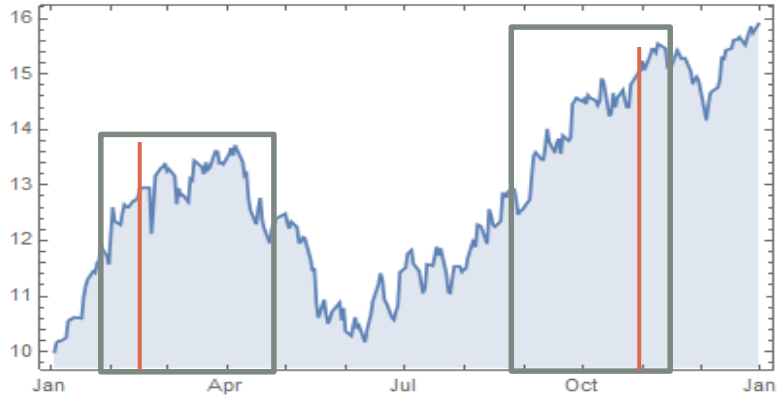
2012 Hershey data



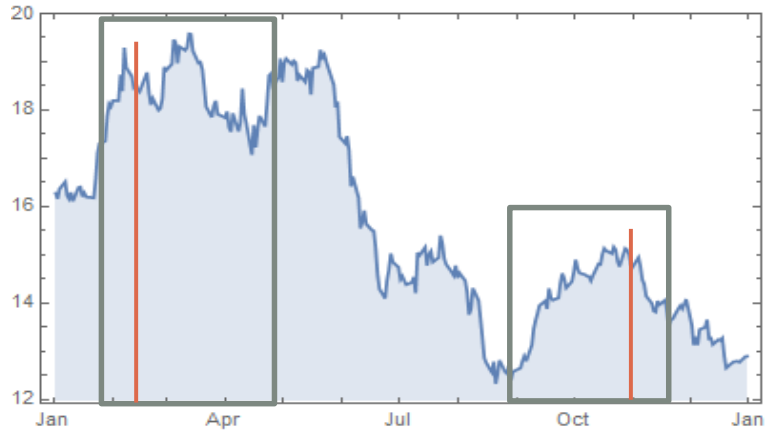
2013 Hershey data



2012 Cosan Ltd data

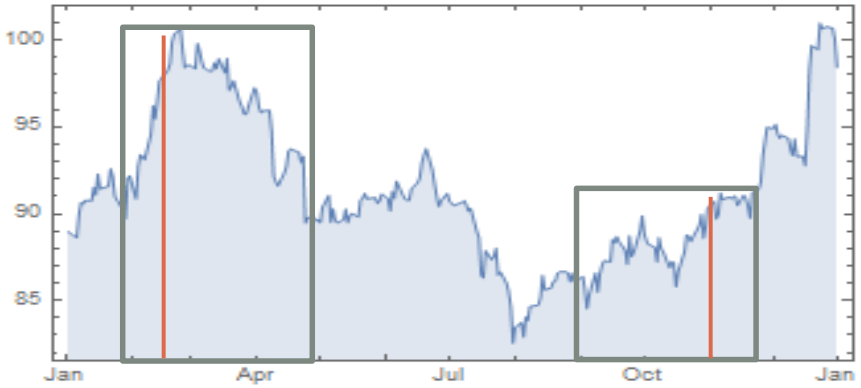


2013 Cosan Ltd data

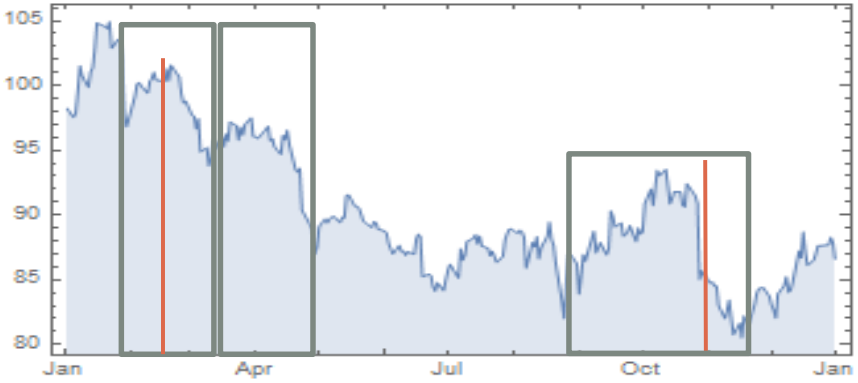


Crude Proof of Concept

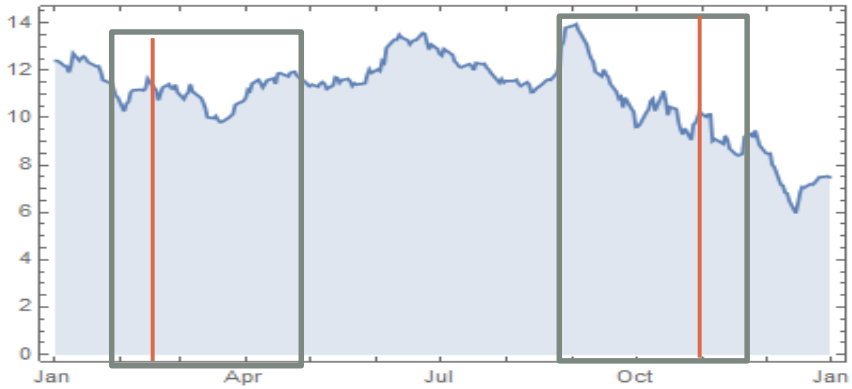
2014 Hershey data



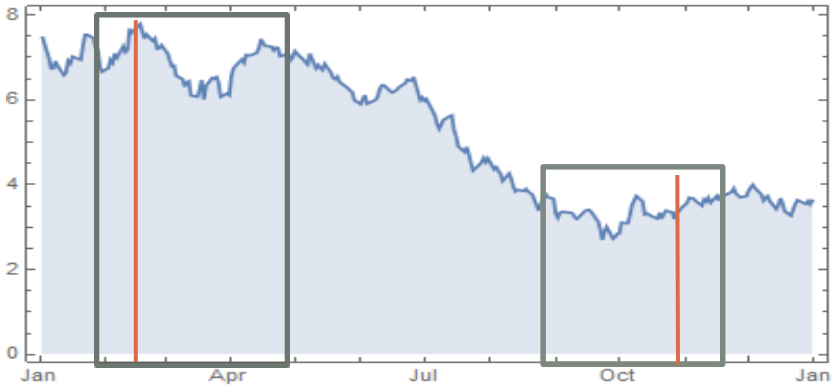
2015 Hershey data



2014 Cosan Ltd data



2015 Cosan Ltd data



Drawbacks

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- Trends are highly circumstantial, therefore difficult to establish a concrete relationship between companies.
- Supposed hidden periodic nature is non-trivial.
- Companies can have multiple frequency based correlations with one another.
- Can only focus on a window of frequencies per processing algorithm
- Model would require multiple algorithms to run in parallel to efficiently model wide spectrum of frequencies in real time.

Future hopes

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- Calculate the most efficient relationship between time desired to project into the future vs. measured frequencies, to run model in real time.

- Do a Fourier analysis of stock market data to deconstruct the normal modes of fluctuation and figure out relationship trends.

- Model follows the formalism of quantum states. Therefore, perhaps it is possible to do a Grover search of the frequencies from companies that interact with the model.

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