

# Support Vector Machines and Artificial Neural Networks: Assessing the Validity of Using Technical Features for Security Forecasting

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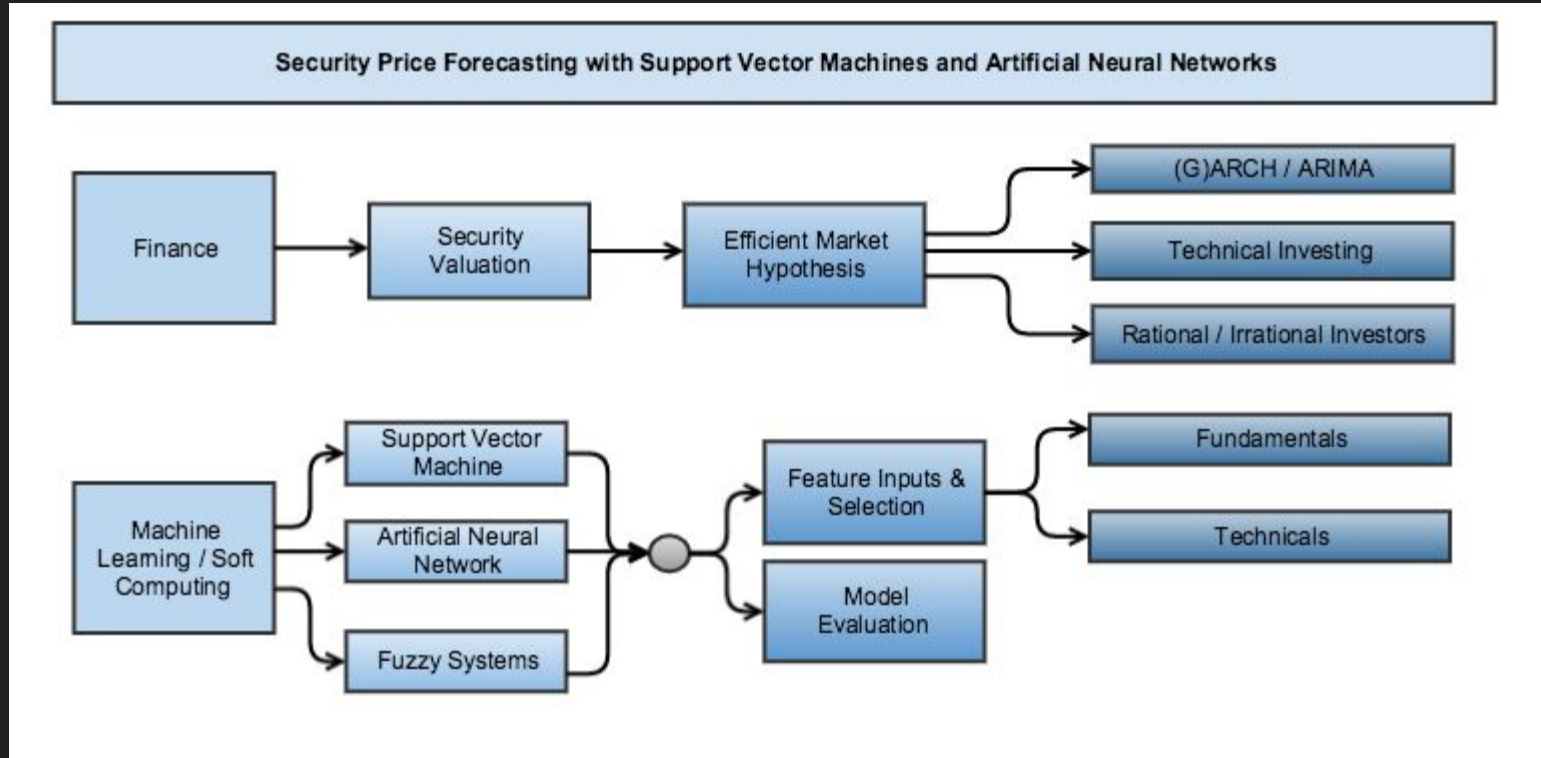
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General Motivation for Work

What are valid inputs (“features”) for security forecasting?

# Literature Review & Background



# Gap in Literature

Despite research indicating promising results from advanced algorithmic price regressions, the literature does not explain the choice of technical over fundamentals as feature inputs, nor does it appear to use a blend of the two.

## Research Question

Are technical indicators a valid input for machine learning algorithms and do they perform at or near the level of fundamentals-only models?

# Research Methods

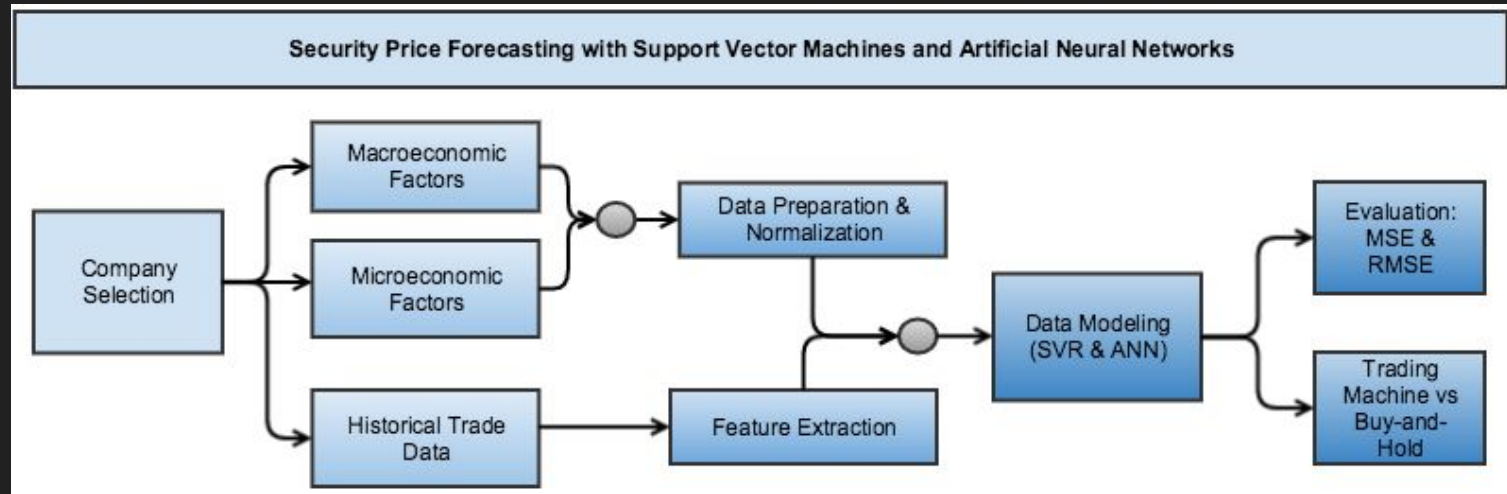
“Secondary, empirical research that seeks to provide an inductive basis for future work by comparing three non-dependent models.”

**Secondary:** The data are gathered from existing repositories

**Empirical:** The data are actual (not fabricated) and measurable

**Inductive:** The empiricism of the study allows for inductive basis for selecting feature inputs

# General Workflow for Security Forecasting



# Experiments Summary

For 12 companies within S&P500:

**Experiment 1:** Technicals-only Features for ANN and SVR

**Experiment 2:** Fundamentals-only Features for ANN and SVR

**Experiment 3:** Blended of (All) Features for ANN and SVR

Compare Mean Squared Error, Root Mean Squared Error and Profitability (vs “Buy-and-Hold”)



# Summary of Results

- Fundamentals-only Models performed at a lower overall MSE/RMSE
- Technicals-only Models performed at nearly the same level
  - Indicating the “irrationality” of using technicals is called into question
- Blended Models did *not* perform better than the pure models
- Artificial Neural Networks (all experiments) may be undertuned
- Direction of market movement may be more suitable of a forecast than spot-price regressions
  - Reflects previous work by other researchers forecasting market direction

## Contribution & Impact

Able to identify that the EMH is called into question and that technical indicators are *ipso facto* valid inputs for machine learning forecasting

# Future Work & Recommendations

1. Forecast Market Direction (rather than *actual* price regression)
2. Automated Trading Machine Use SVR/ANN forecast against *itself* and not *actual* when making purchases
3. Expand Included Technical and Fundamental Features
4. [ANN] Model Tuning on Company-level, not “generic”
5. Expand Studied Companies
6. Finer Grain: Hourly Training

# Q&A

Thank You :)