



Synechron

The Model Building Process for Forecasting REIT Financial Factors

Authored by:

Pranesh N.

Head, Synechron Data Science
and Data Modelling Practice
Bengaluru, India



The financial performance of a REIT is influenced by various factors such as the consumer price index, delinquency rates, retail sales, and mortgage rates.

These can be effectively modelled using multivariate time series analysis techniques and forecasts for the immediate time horizon, facilitating investment decisions. In this paper, we briefly outline the procedure followed in model building and forecasting.

Introduction



Synechron has built an accelerator to help investors make an informed decision based on the performance related to certain financial factors of REITs.

It is widely acknowledged that the financials of REITs are influenced by various external factors including some macroeconomic variables. A machine learning model could be built forecasting REITs' financials for the immediately foreseeable future up to two periods, i.e., two quarters ahead.

Data collection and preparation



Data related to REIT financials and the influencing factors are measured and collected from verified sources of information on a quarterly basis spanning up to ten years of past data.

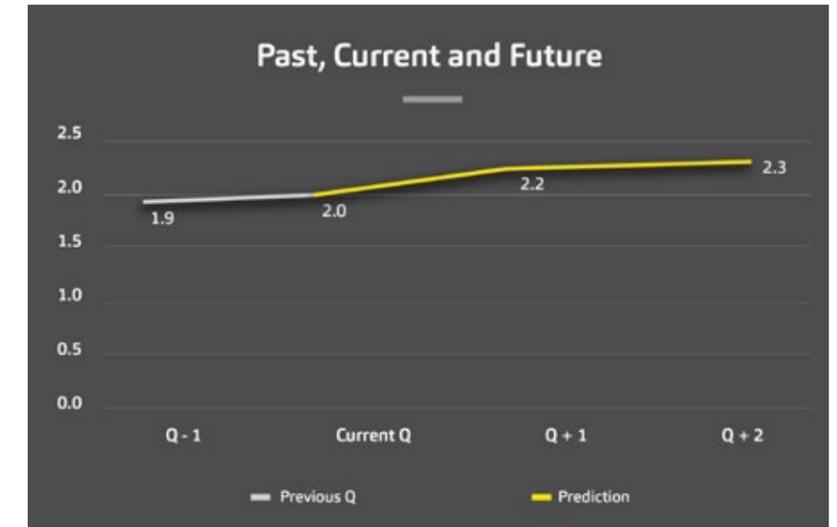
During exploratory data analysis, missing values or outliers observed require no additional treatment. Test set data consisting of two periods and rest were included in training data sets.

Model selection



Since the analysis required multivariate time series analysis techniques, Vector Auto Regression (VAR) or Vector Error Correction (VECM) Models are used depending on the satisfaction of model assumptions.

Model building and validation



On checking for stationarity using the augmented dickey fuller test, most of the variables/series exhibited non-stationarity, and turned out to be stationary after differencing, thereby proving a co-integrating relationship. Granger causality tests proved some of the external factors' granger causing REIT financials.

Moreover, lag selection is done using Akaike Information Criterion (AIC), and Johansen cointegration tests conducted on data revealed a higher rank of cointegration. From all of the hypothesis tests conducted and results derived, this required VECM models to be built and used for forecasts.

Performance, in terms of accuracy on the test set, varied hugely reaching upwards of 97% for some REITs. Forecasts are generated using VECM models and projected on user screens for better decision making purposes.

Conclusion

VAR/VECM models are built depending on the satisfaction of assumptions, and forecasts for two periods ahead are generated for all REIT financial indicators. Investors may decide to invest in the REITs if the generated forecasts are within their expectations or completely overrule forecasts at their discretion.

For more information, please contact

Uday Chaudhari, Senior Director - Technology at
uday.chaudhari@synechron.com

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www.synechron.com
