FIN3380 Group Assignment #3. Beating Analyst Forecasts

In this project you are asked to forecast future earnings and compare your forecasts to those of Wall Street analysts.

Existing academic research demonstrates that the market fixates on "earnings surprises" relative to consensus analyst earnings forecasts (i.e., the difference between realized earnings and forecasted earnings). Those firms that outperform (underperform) analyst forecasts experience large positive (negative) price changes around earnings announcements. In addition, stock prices continue to drift in the direction of the surprise over the next several days as the market "digests" the news.

Wall Street analysts are human, and by virtue of being human, often issue biased forecasts: over- or under- weighting certain pieces of information. Consequently, their forecast errors are predictable. Hedge fund managers often seek to predict analyst forecast errors, and generate more accurate forecasts than analysts, in hopes of trading the stock in advance of earnings announcements and profiting from the associated price changes. The better the forecast model, the greater the fund managers' relative information advantage over other market participants.

Part I. Predicting Earnings.

Using the material we have covered in class, develop a linear prediction model for future earnings:

$$Earn_{t+1} = \alpha + \beta_1 Z_{1,t} + \beta_2 Z_{2,t} + \ldots + \beta_n Z_{n,t} + \varepsilon_t. \quad (1)$$

where $Earn_{t+1}$ is one-year ahead future earnings, either measured as a fraction of assets, or on a per-share basis, and $Z_1 \ldots Z_n$ is a vector of n financial statement variables measured prior to $Earn_{t+1.}$ Estimate your linear prediction model on all firm-years with available data through 2017. Assess whether the financial statement variables included in your model (i.e., the Zs) are significant predictors of future earnings by conducting t-tests for whether each of the coefficients (i.e., the βs) is different from zero.

Describe your model, the rationale for the inclusion of each variable, and report your statistical findings (coefficient estimates and t-statistics). Summarize the results and what you have learned from the results.

Part II. Predicting analyst forecast errors.

Repeat the analysis in (1), using the model to predict analyst forecast errors (*AFE*) on all firm-years with available data through 2017.

$$AFE_{t+1} = \alpha + \beta_1 Z_{1,t} + \beta_2 Z_{2,t} + \ldots + \beta_n Z_{n,t} + \varepsilon_t. \quad (2)$$

where AFE_{t+1} is the consensus analyst forecast error for one-year ahead future earnings (AFE_{t+1} = $Earn_{t+1}$ – $Forecast_{t+1}$), either measured as a fraction of assets or on a per-share basis as in Part I, and Z_1 … Z_n is the same vector of *n* financial statement variables used in Part I. Assess whether the financial statement variables included in your model are significant predictors of the consensus forecast error by conducting *t*-tests for whether each of the coefficients is different from zero.

Report your statistical findings. Summarize the results and what inferences you draw about how analysts are under- or over-weighting specific financial statement variables in your model.

Part III. Out-of-Sample Testing.

Use the estimated coefficients from (1) together with the *Z*s measured in 2018, to predict earnings for 2019.

$$Predicted\_Earn_{2019} = \hat{a} + \widehat{\beta_1} Z_{1,2018} + \cdots + \widehat{\beta_n} Z_{n,2018}$$

For each firm, calculate the 2019 absolute forecast error (*ABFE*) and the 2019 mean-squared (*MSFE*) forecast error

$$ABFE_{2019} = |Earn_{2019} - Predicted\_Earn_{2019}|$$
$$MSFE_{2019} = (Earn_{2019} - Predicted\_Earn_{2019})^2$$

and report the average values of $ABFE_{2019}$ and $MSFE_{2019}$ for your model. Repeat using the consensus analyst forecasts to calculate the average values of $ABFE_{2019}$ and $MSFE_{2019}$. What do you infer about the quality of your 2019 forecasts relative to that of Wall Street analysts?