

Homework 3

Due on March 21 by 6 pm

FINA 9210 - Spring 2013

Empirical Research in Investments

©2013 Alexander Barinov

1 A Look at the Possible Explanations of the Analyst Disagreement Effect (*100 points*)

This homework looks at the potential explanations of the negative relation between dispersion of analyst forecasts and future returns. It was first documented in Diether, Malloy, and Scherbina (JF 2002) and is usually called the analyst disagreement effect in subsequent work. You will need a slightly updated data on the default premium, the dividend yield, the Treasury bill, and the term spread (see hw3data.xls on the course website). You will also use in this homework the monthly Amihud illiquidity measure (Amihud, JFM 2002). The Amihud measure measures the price impact and is defined as the average ratio of returns to dollar volume within each month (Amihud, JFM 2002, does inflation-adjustment for the volume, but we will not worry about it at that point). The point of the Amihud measure is to see how big is the price response caused by a certain amount of volume. The assumption is that all price response is temporary and it will bounce back in the future, hence the Amihud measure would be the measure of price impact and the trading costs associated with it.

- i. Each month, perform quintile sorts on the standard deviation of analyst forecasts of one-year-ahead EPS using the data from 1984 to 2009, as in Diether, Malloy, and Scherbina (JF 2002). Use NYSE quintile breakpoints. For each quintile, report the average equal-weighted returns, the equal-weighted CAPM alphas, and the equal-weighted Fama-French alphas. Test whether the difference in the returns/alphas between the bottom and top quintile is economically and statistically significant. Does the analyst disagreement effect come primarily from the long side or the short side? (Hint: the WRDS file you want to use here is `ibes.nstatsumu_epsus`. Drop non-US firms from your analysis). (*15 points*)
- ii. For each quintile, report the average values of the following measures: number of analysts following the firm, market cap, price, market-to-book, and the Amihud

measure (make sure you adjust the units to make the table readable). Measure all firm characteristics except for market-to-book in the portfolio formation month, measure market-to-book at the end of the previous fiscal year. Test the significance of the difference between the medians of the top and bottom quintiles. (Hint: The WRDS file you should use for constructing the Amihud measure is the daily CRSP file `crsp.dsf`. Construct the Amihud ratio in each day and then average within each firm-month to obtain the monthly Amihud measure). *(15 points)*

- iii. Is the pattern in the average size and market-to-book in (ii) consistent with the pattern in the SMB betas and the HML betas? Does the variation in size, price, illiquidity, and analyst following across the disagreement quintiles make it harder or easier to reconcile the analyst disagreement effect with market efficiency? *(10 points)*
- iv. Perform conditional double sorts on analyst following and analyst disagreement (first sort into quintiles on the number of analysts covering the stock, then, in each quintile, on the standard deviation of analyst forecasts). Report the CAPM alphas for all 25 portfolios, as well as the analyst disagreement effect in all analyst following quintiles and the difference in the analyst disagreement effect between the bottom and top analyst following quintiles. Measure the analyst disagreement effect as the difference in equal-weighted CAPM alphas between the top and bottom disagreement quintile. *(10 points)*
- v. Is the dependence of the analyst disagreement effect on analyst following consistent with the hypothesis that the analyst disagreement effect is mispricing? Is this dependence consistent with a potential risk-based story or the trading cost story? *(5 points)*
- vi. Define DISP portfolio as the return differential between the top and bottom analyst disagreement quintile. For each analyst following quintile, as well as for the whole sample, regress the returns to DISP on the default premium, the dividend yield, the Treasury bill, and the term spread. Report all the slopes. Do the slopes and their dependence on analyst following suggest that the analyst disagreement effect and its dependence on analyst following can be explained by risk? *(10 points)*
- vii. In the spirit of Chordia and Shivakumar (JF 2002), use the regressions from (vi) to predict the returns to DISP. Define expected return to DISP as the fitted part less the constant. In order to make sure that in each moment in time you use only the information available to investors, start in January 1988 by running the regression using data from January 1984 to December 1987, and use its coefficients and the values of the four macroeconomic variables in December 1987 to predict the DISP

return in January 1988. Expand the sample one month at a time without dropping any old observations. If we label the expected part of the DISP return as "risk-based", what part of the analyst disagreement effect is explained by risk? Given the evidence in (vi), how confident we are that the expected part of DISP is risk-based? *(15 points)*

- viii. Look at the analyst disagreement effect in event time by reporting the CAPM alphas of the analyst disagreement quintile portfolios and the DISP portfolios one, two, etc. up to six months after the portfolio formation. Interpret the evidence assuming the market is inefficient and the analyst disagreement effect is mispricing and assuming that the market is efficient and the analyst disagreement effect is risk. *(10 points)*
- ix. Assume that you will try to trade on the analyst disagreement effect turning around \$1 million in each share you have to buy or short. You will hold the positions open exactly for six months and close them afterwards. What will be the CAPM alpha of the DISP portfolio net of the price impact costs? Use the results from (ii) and (viii) and assume that you trade after all price impact has happened. *(5 points)*
- x. Go back to the the double sorts in (iv) and replace all alphas by average Amihud ratios. Does it look like the trading cost story can explain why the analyst disagreement effect is stronger for the firms with low analyst following? *(5 points)*