



Put-Call Ratio as a Predictor of Earnings Reporting Results



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INTRODUCTION

Put-call ratio is defined as traded volume (or open interest) in put option contracts divided by volume (open interest) of call options for the same underlying asset. This metric is viewed by investors as a measure of investors' sentiment regarding future performance of this specific asset. Put options are used by speculators to bet on downward price moves, while call options are used by traders with positive outlook for the future performance of an asset price. Therefore, high put-call ratios are often viewed as a bearish sentiment and low ratios may signal future upsides in performance.

In our study, we are investigating if put-call ratios can be used as a predictor for stock performance around the earnings reporting dates for the largest 100 firms in S&P500 index. The reason behind sampling only the largest firms is that large firms have very liquid option markets: a large selection of strike prices in their option chains, most of the sampled firms have weekly, monthly and quarterly options series.

Generally speaking, the higher put-call ratio represents that investors expect the stock should go down, which means that the put-call ratio is correlated negatively with the price effect. Hence, in this study, we are not only going to test whether the independent variable is significant but also whether the put-call is correlated with the price effect negatively.

DATA

The data used in the study includes the following: daily closing stock prices, for returns calculation after earnings release, as well as options data for the purpose of calculating put-call ratios. Ratios were calculated based both on a number of contracts and on dollar values of those contracts to account for differences in moneyness of the options. Open interest was calculated over a month beyond the earnings release date. Put-call ratio is used to explain the next day stock price performance after the earnings. All data used in this research is from Jan 2014 to May 2017.

DISCUSSION

Results of the robust regression and the two stage extended model suggest that the put-call ratio does not work well as a predictor for the performance of stocks on the earnings release date. There are some possible explanations of these results: firstly, the market is largely viewed as being efficient, hence, the put-call is not a consistent predictor of the price moves to earn excess returns; secondly, within the expiration date of the option contracts the earnings releases are not the only critical event, other uncertain events influence the performance of the stocks; thirdly, non-homogeneous beliefs among investors regarding earnings expectations may skew the values of the ratio and, therefore, distort the meaningfulness of it.

The next step in this project is to focus on the stocks with the extreme values of the put-call ratios. Very large or small values of the ratio may indicate more homogenous investors' believe regarding earnings release. This may represent an opportunity for investors to capitalize upon by predicting directional price moves of the corresponding stocks on the earnings release day.

METHODS

In this research, we built the model based on Robust Regression. The dependent variable is the Price Effect, and the independent variable is the put-call ratio. The equation represented as

$$\text{Price Effect} = \beta \cdot \log(\text{Put-Call}) + \mu$$

The price effect is the closed price change rate of the previous day of earning day and the earning day. Put-call is the put-call ratio. We calculated the both contracts based put-call ratio and the dollar based ratio. The option contracts we used in this research had an expiration date within 40 days from the earning day. Since the range of the put-call ratio is from 0 to 1, and because the sample points distributed more smooth when linear, the put-call is formed as $\log(\text{put-call})$. The β is the coefficient of independent variable, and μ is the disturbance items.

We first ran the model with the full time range and all 97 companies sample, and get Table 1, the overall statistic. To evaluate that whether the put-call ratio works effectively as a predictor for the performances of the stocks.

For the second step, we divided the whole model into two stages models by times. For the first stage model, we used the data from January 2014 to July 2016 and ran the model by 100 companies individually, picking up the company which the model is significant. After this, we then rerun the model by individual company based on the time from July 2016 to May 2017, to test whether those company significant in the first stage model still significant and still keep the same tendency in the second model.

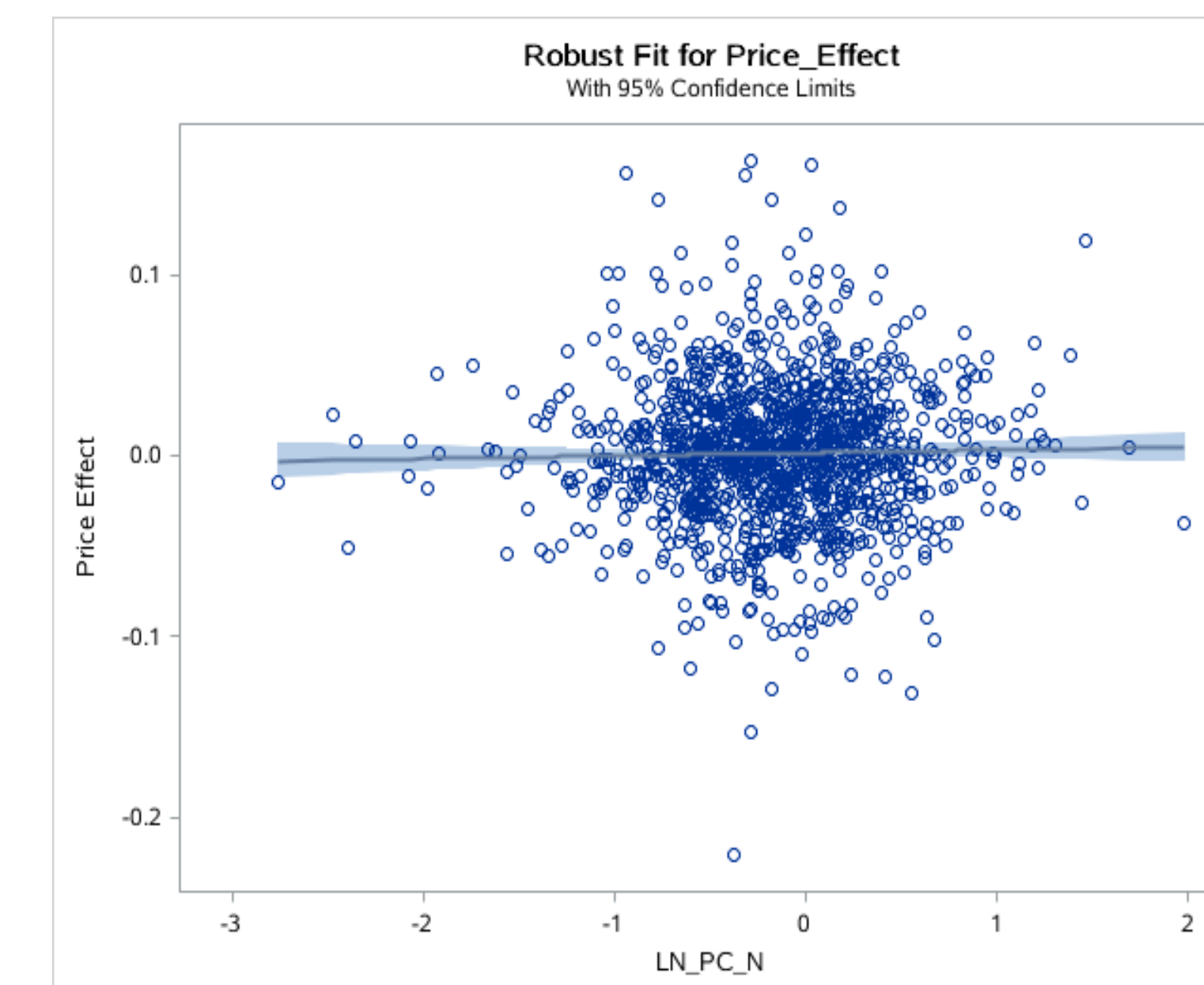
Preliminary Results

Preliminary results of the regression analysis (price effect was regressed on corresponding put-call values, model was re-run with industry and firm-level fixed effects) show that put-call ratio is not a good predictor of the actual earnings results. This may be an indication of: a) markets efficiency; b) non-homogeneous beliefs among investors regarding earnings expectations or both.

RESULTS

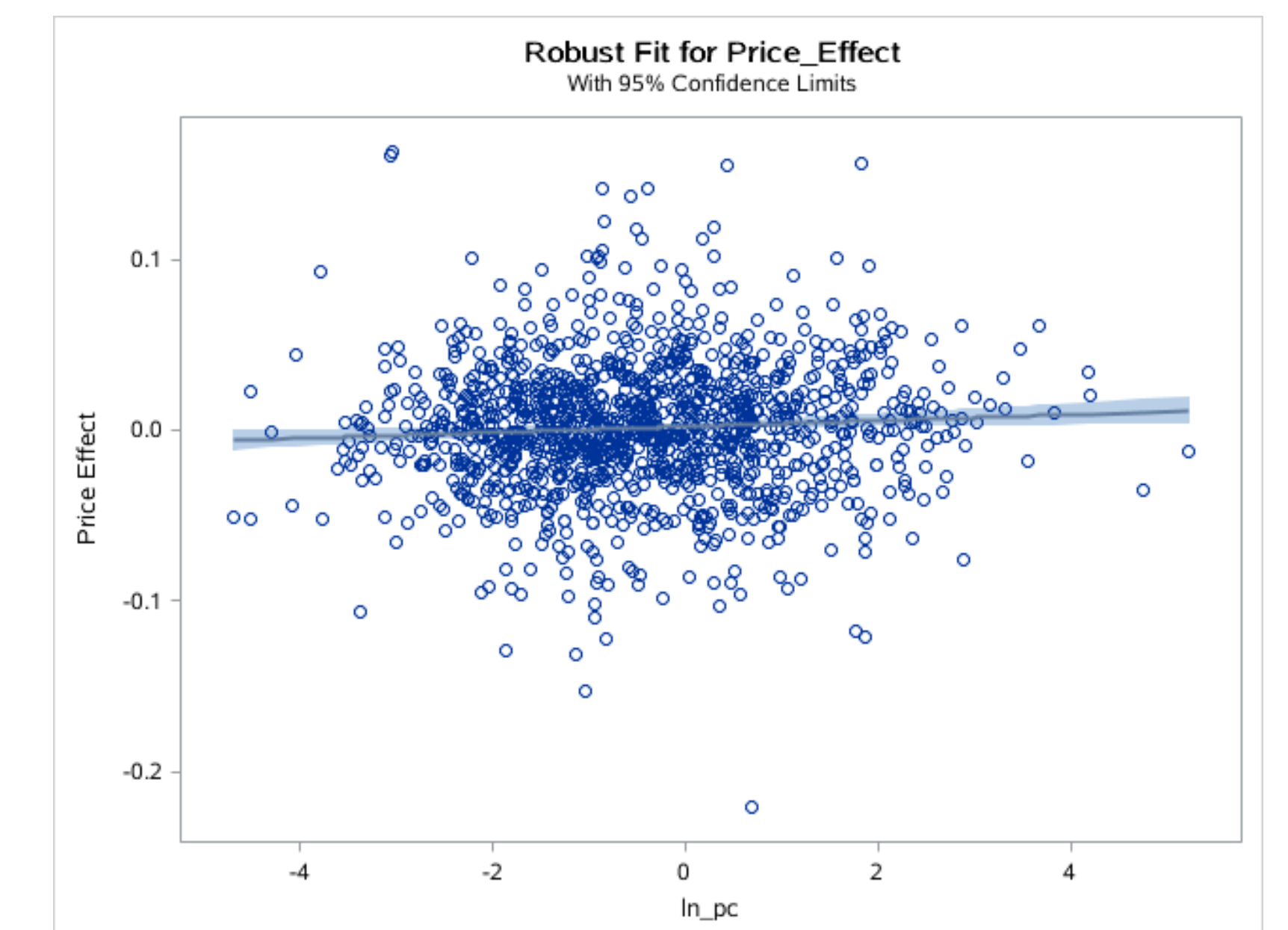
Overall Statistic Contract Based Put-call Ratio

	Estimate	Std	T Statistic
Intercept	0.001	0.001	1.400
LN_PC_N	0.002	0.002	0.842
R-square	0.001		
Observations	1,280.000		



Value Based Put-call Ratio

	Estimate	Std	T Statistic
Intercept	0.002	0.001	2.000
LN_PC_N	0.002	0.001	2.429
R-square	0.004		
Observations	1,280.000		



Two Stages Model

