Financial Ratio Quantile Strategies

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1 Understand Your Data

Read all documentation webpages for Zacks Fundamentals B. The strategy coding for this assignment will be reasonably easy. The data assembly, deliberately, is the difficult part.

2 Define the Universe

Choose at least 200 tickers[1] of US equities such that, over the entire period[2] Jan 2011 through Jan 2018, they satisfy the following:

- end-of-day adjusted closing prices are available
- debt/market_cap ratio is greater[3] than 0.1 somewhere in the period (preferably more than fleetingly)
- not in the automotive, financial or insurance sector[4]
- has available the ratios specified below, no more than one year old as judged by filing dates

[1] You can find the full list of available tickers online

[2] We will not concern ourselves with *selection bias* in this exercise.

[3] This is about 1000-2000 companies, including ARE, ORCL, TISI and WRLD.

[4] See the Quandl ZFB fields `ZACKS_SECTOR_CODE`, `ZACKS_X_IND_CODE`, and the classification list

3 Select Financial Ratios

For this assignment, we will work with the following ratios:

- debt to market cap[5]. You may assume a debt field is zero if it was reported as NaN.
- price to book[6]
- price to earnings[7]

Note that these data items are reported (at best) quarterly. As the equity price changes day-to-day, each ratio changes accordingly.

4 Beta Neutral

Now we will apply beta neutrality to reduce sensitivity of our portfolio returns to overall market performance. For each position in a security S, as of a given simulation date d, perform an ordinary least squares linear regression of its daily returns on adjusted close[8] prices over the previous calendar month[9] to those of the SPY ETF.

$$r_S \sim \alpha_0^S + \alpha_1^S r_{\text{SPY}}$$

To achieve beta neutrality, we simply assume that, in addition to $\$x$ of this security, your portfolio takes on a position of $-\$\alpha_1^S x$ in the SPY ETF.

5 Analysis

Study performance of weekly or monthly quantile trading strategies using each of these single ratios as well as your choice of least one nontrivial combination of them[10].

[5] `ZFB/NET_CURR_DEBT + ZFB/TOT_LTERM_DEBT` and `NBR_SHARES_OUT` in Quandl

[6] based on `ZFB/BOOK_VAL_PER_SHARE` in Quandl

[7] based on `ZFB/DILUTED_NET_EPS` in Quandl, or regular earnings per share if never diluted

[8] You can use the Quandl EOD database to obtain this data

[9] For example, for March 4 our regression uses trading days from Feb 4 to March 3. For August 12, it uses July 12 to August 11

[10] That is to say, at least 4 types of scores.

You may assume zero trading costs, that trading fractional shares and arbitrary positions sizes are possible, that all securities are easy to borrow, and that the portfolio capital is equal to the gross notional. Choose either a constant funding rate, or rolling 3-month LIBOR.

Analyze performance of a top-and-bottom decile trading strategy. Now rank based on *changes* in your ratios rather than the ratios themselves. Play with the effects of sizing positions by rank.