Dividend strategy: towards to the efficient market

Vyacheslav Arbuzov [1,2,3]

[1] *Department of Economics, Perm State University, Perm, Russia*

[2] *Criptoeconomics & Blockchain Systems Lab, Perm State University, Perm, Russia*

[3] *Olympia Capital, Moscow, Russia*

Abstract

At this paper we describe efficiency of market near ex-dividend date. For our analysis we 1850 US stocks, from 2005 year. We analyze strategy of buying at closing price prior 1 day to ex-dividend date and selling at open price in ex-dividend date. We find that such strategy potentially profitable with Sharpe ratio 1.5, but including tax and transaction costs made strategy unprofitability. We constructed the logit model which have prediction power for dividing all trading days at this strategy to profitable and unprofitable periods.

It is well known that stock prices fall by less than the dividend paid on ex-dividend days. This behavior constitutes ex-dividend day anomaly is considered a stylized fact. In a pioneer investigation with a small sample of companies quoted in the New York Stock Exchange, Campbell and Beranek (1955) reported that stock prices adjusted by less than the dividend paid. They observed that prices dropped on average by 90% of the dividend paid on ex-dividend dates. The authors, however, did not offer any explanation for this anomalous behavior. Some authors try to explain a price drop less than the dividend using microstructure effects (Frank and Jagannathan (1998); Bali and Hite (1998)).

Data

For analysis we use dividend information and daily price on 1850 US stocks and period from 2005 year to 2017. Data was download from *finance.yahoo.com* using *quantmod* package. We find that dividend yield of most stocks are less than 1% and it's related with quarterly specific of data.

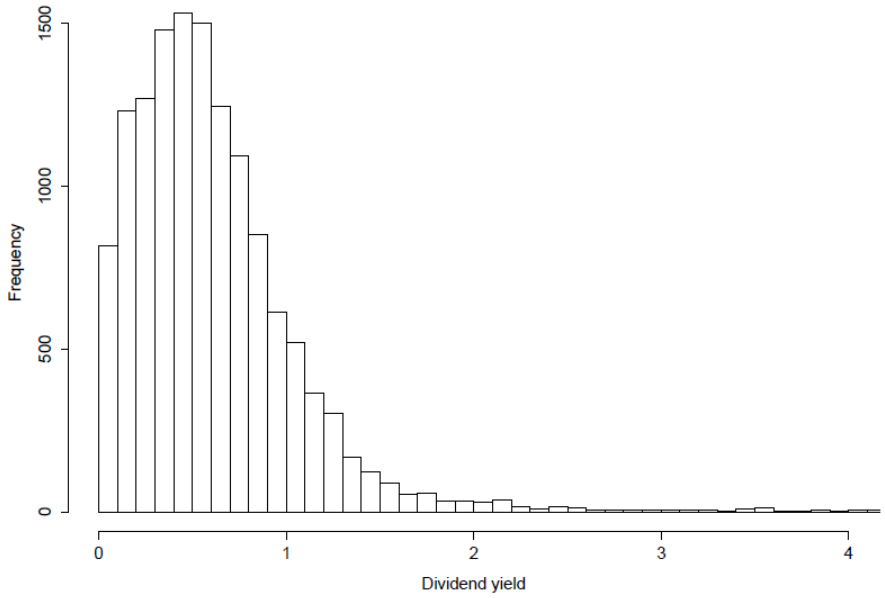

Figure 1. Distribution of dividend yield

The Ex-Dividend Day Anomaly

We tried to see the dependence of the night gap return prior to ex-dividend date and the size of dividend payout. We can find that: (a) the stock price drops less than the dividend payment, and (b) a negative correlation exists between gap and dividend yields, (c) excluding tax from dividend, gives in median, the size of gap (see quantile model in figure 2).

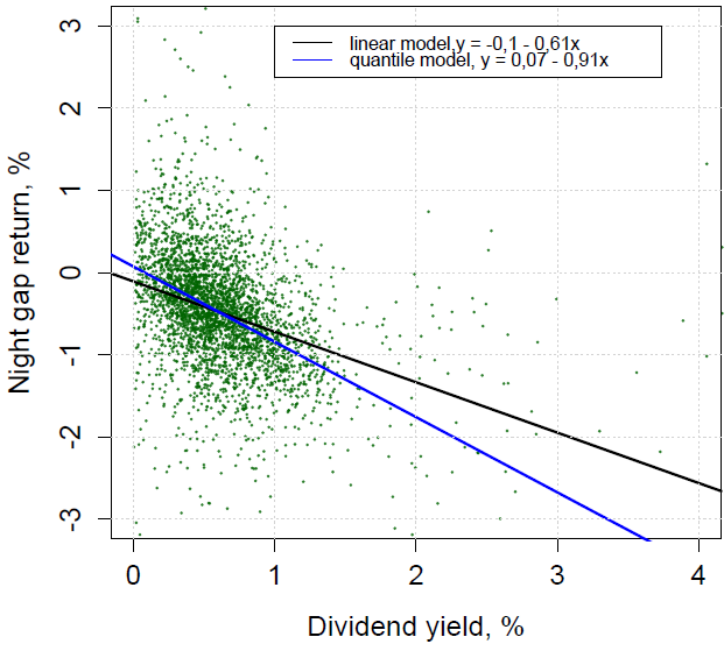

Figure 2. Scatterplot of dividend yield and night ex-dividend return

We try to calculate performance of strategy with zero tax and without broker commission. Such strategy seems good with 1.5 Sharpe ratio.

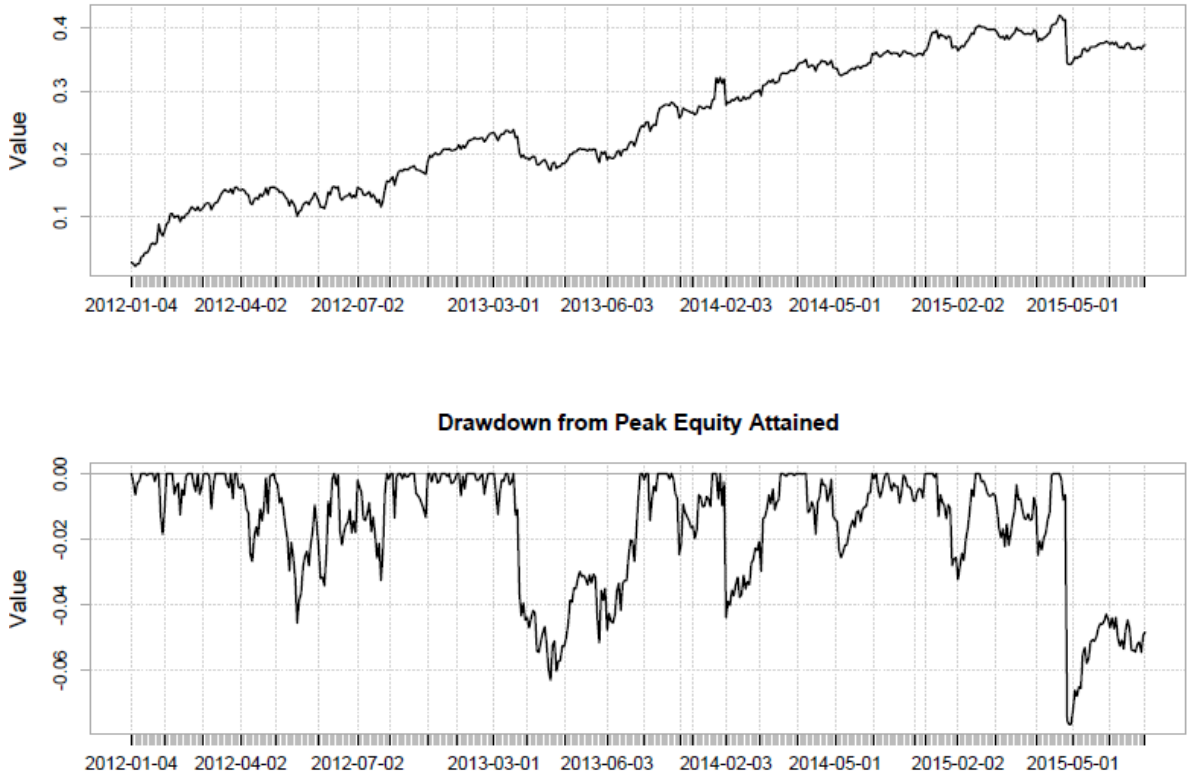

Figure 3. Performance of buying dividends, excluding taxes and transaction costs

At the next step we analysed sensitivity of strategy performance to tax size and find that 10% tax to dividends makes this strategy unprofitable (see figure 4). This is not strange, because at such simple strategy, market should be effective and the participants with lowest taxes and transaction costs destroys any inefficiency.

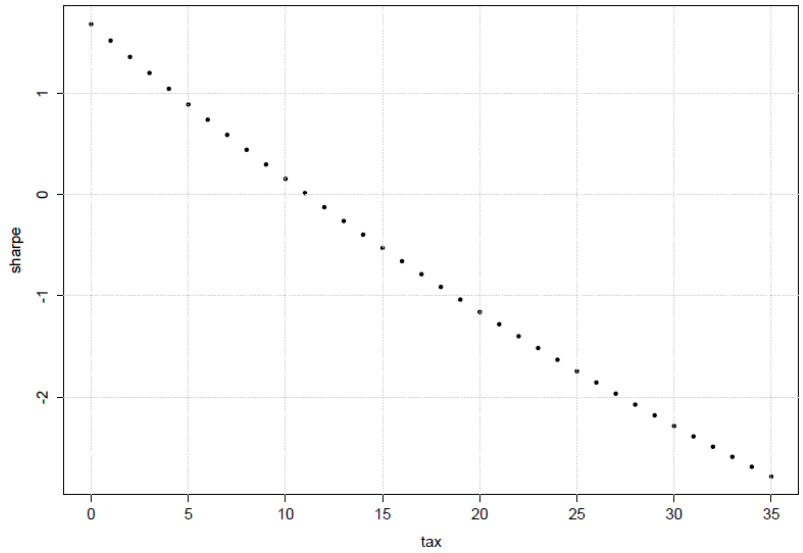

Figure 4. Scatterplot of strategy performance and taxes percentage

The Ex-Dividend gap logit model

We trying to create model for buying dividend with taxes equal to 35%. For this purpose, we calculate night returns of gap and 65% of dividend payout.

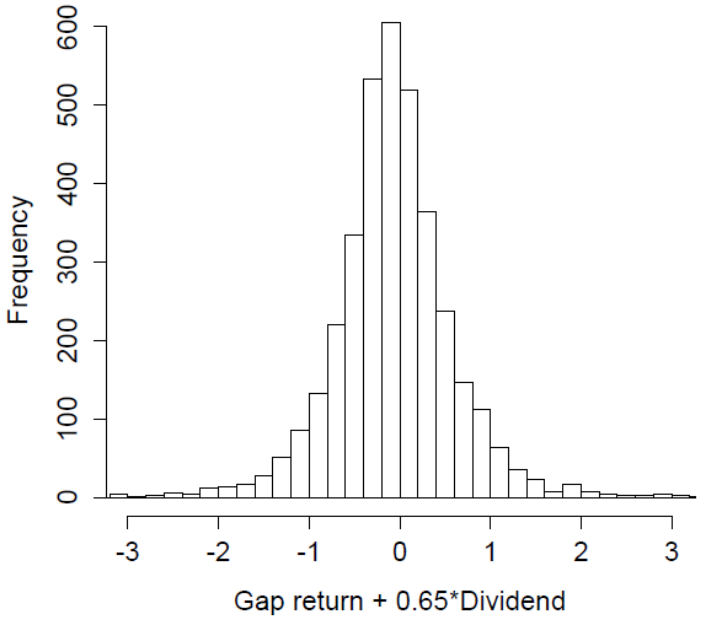

Figure 5. Target distribution of PnL

After that, we divided this distribution to positive and negative parts and encoding this returns as 1 and 0. Also we calculated different market characteristics in date prior to ex-dividend date and try to analyse dependency of pnl with this characteristic. We find that, our PnL depended on: trading volume, volatility, size of dividend and different price characteristics. Summary of model you can find at figure 6.

```
Call:
glm(formula = paste("Target ~ ", paste(names(Dividend_train_sample)[logit_factors],
    collapse = " + "), sep = ""), family = binomial("logit"),
    data = Dividend_train_sample)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-2.6951  -0.8397  -0.3245   0.8634   2.5598

Coefficients:
                          Estimate Std. Error z value Pr(>|z|)
(Intercept)              -0.52087    0.16608  -3.136 0.001712 **
discr_Volume              0.13316    0.05043   2.640 0.008287 **
discr_HLC_vol            -0.07480    0.01838  -4.069 4.72e-05 ***
discr_MDTV3              -0.12801    0.04964  -2.579 0.009916 **
discr_Morning_runtest    -0.03042    0.01466  -2.075 0.038022 *
discr_Evening_kurtosis   -0.06087    0.01678  -3.627 0.000287 ***
discr_Evening_skew        0.33321    0.02095  15.906  < 2e-16 ***
relative_dividend         0.25911    0.08129   3.188 0.001435 **
day_return              168.48285    7.29013  23.111  < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for binomial family taken to be 1)
```

Figure 6. Performance of buying dividends, with taxes and transaction costs

Final performance of strategy you can find at figure 7 (black line). There is well known fact that sometimes it is impossible to execute order on the price of open. We analyzed sensitivity of strategy performance to execution and find that performance is very sensitive, especially first 5 minutes from open of exchange.

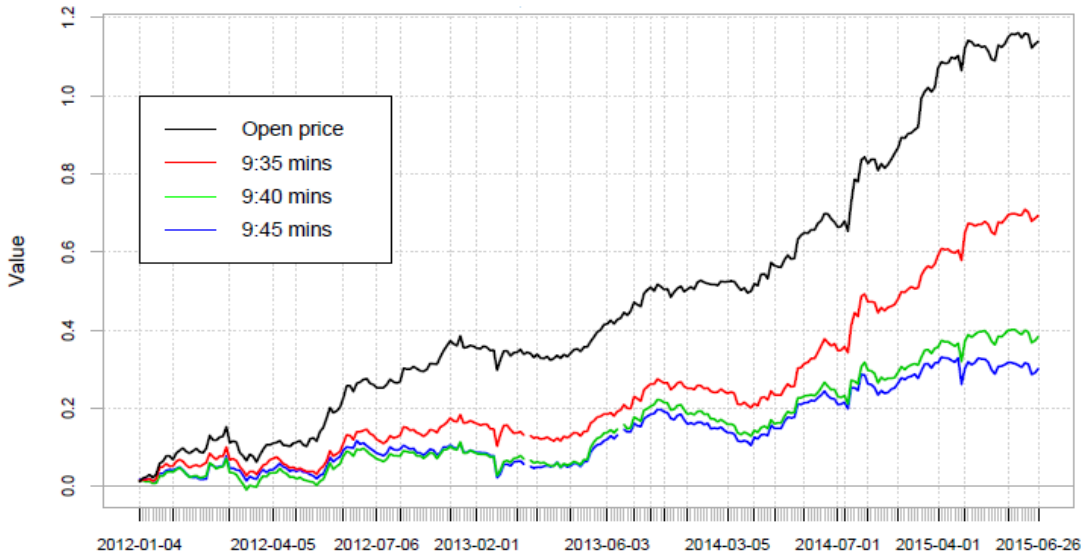

Figure 7. Performance of buying dividends using logit model

References

Campbell J, Beranek W (1955): Stock price behaviour on ex-dividend dates. Journal of Finance, 10: 425–429.

Frank, M., & Jagannathan, R. (1998). Why do stock prices drop by less than the value of the dividend? Evidence from a country without taxes. Journal of Financial Economics, 47(2), 161-188.

Bali, R., & Hite, G. L. (1998). Ex-dividend day stock price behavior: discreteness or tax-induced clienteles? Journal of Financial Economics, 47(2), 127-159.