Long-Only, Short-Term Trading Strategy to Capture Drift After Stock Buyback Announcements

1. Abstract

We develop a strategy built upon the findings of Amini & Singal (2020) which established that upward drifts of stock price resulting from stock buybacks persist for a minimum of 60 days. In light of this, we investigated the profitability of a long-only trading strategy, taking a long position in shares of U.S. listed companies that announce stock buybacks for a 60-day period post-buyback announcements, we find that our strategy produces, on average, 21.22% abnormal returns annually when benchmarked against the S&P500 over a period of 14 months.

2. Introduction

This study aims to acquire a public trading strategy, improve upon aforementioned strategy, and backtest the strategy to determine effectiveness. In pursuit of this, we investigate the strategy of taking long positions on stocks which announce a stock buyback close to an earnings announcement (detailed description under in Heading 3 - Public Strategy). This strategy's objective is to exploit the steady upward drift in stock prices due to positive signalling effects of a buyback and investors' tendency for slow information incorporation.

As for our improved strategy, we find that the earnings announcements are not relevant to the returns achieved by the original public strategy, hence, we take long positions in stocks of all companies that announce buybacks, not solely the ones who announce buybacks close to earnings announcements. Subsequently, we relax certain constraints that were present in the public trading strategy, informing our decision with findings from Amini and Singal (2020).

To test our strategy, we conduct a backtest on Quantopian. Quantopian's unfortunate demise, restricted our testing. We had just attained preliminary findings. The preliminary results were promising, depicting a raw return of 34% over a period of 14 months with a 6-month rolling sharpe ratio of 2.08. These results should be evaluated with due care and consideration given their preliminary nature (detailed description under Heading 6 - Results).

Finally, we acknowledge certain limitations and potential areas of future research which comprises identifying buybacks which do not indicate undervaluation and altering/expanding the holding period in the strategy.

3. Public Strategy

3.1 The strategy

The public strategy examined, trades all U.S. listed companies barring the bottom 25% of companies by market capitalisation. Every quarter, the investor identifies companies that announce a stock buyback program (with announced buyback for at least 5% of outstanding stocks) during days -30 to -15 before the earnings announcement date for each company. The investor takes a long position on stocks with announced buybacks during days -10 to +15 around an earnings announcement. The portfolio is equally weighted and rebalanced daily (Earnings Announcements Combined with Stock Repurchases, n.d.).

This trading strategy draws inspiration from Amini and Singal (2020). Amini and Singal studied the predictability of market reactions to earnings announcements by examining if the market has fully incorporated the information from the corporate actions (e.g. buybacks) that precede the earnings announcement. Amini and Singal (2020) found four-factor abnormal returns of +1.7% in the 30-day period following an earnings announcement if the earnings announcement is preceded by a buyback announcement. This is precisely the returns this strategy wishes to exploit.

3.2 Economic rationale behind the public strategy

3.2.1 Short-term upwards drift

In their study, Amini and Signal (2020) observed that market reactions to earnings announcements are predictable due to the corporate actions that precede them. In the case of a share buyback, Amini and Singal noted an upwards drift of the stock price that lasts at least 60 days post-buyback announcement. This drift was found to be distinct and more significant than the post earnings announcement drift (PEAD), hence, the predictability of market reactions to earnings announcements. This drift was the main driver of the +1.7% abnormal returns the strategy wishes to exploit.

The upward drift is explained by two main arguments. First, stock prices increase after a buyback in the short term. Second, investors are slow in incorporating information disseminated in corporate actions like buybacks.

It is generally accepted that managers have more information about the firm than investors (Myers & Majluf, 1984). Given this information asymmetry, managers can make informed decisions about corporate actions such as equity offerings, buybacks, dividends, and mergers, in an effort to maximize value of the firm for current shareholders. Mishra (2005) suggests that as

a result of this asymmetry, in normal market conditions, buyback announcements boost the share price by signalling to investors that underlying shares are currently undervalued. This is supported by the finding that the magnitude of the price impact of a buyback is proportional to the level of information asymmetry before the announcement of the action (Korajczyk et al. 1991).This was empirically verified for buybacks in Amini and Singal (2020) which found a positive correlation between the level of information asymmetry which can be reliably measured using Bid-Ask spreads according to Venkatesh and Chiang (1986), and the positive abnormal returns discovered in the short term after the buyback in Amini and Singal (2020)

Also, share buybacks decrease the total number of outstanding shares of a company. Overall, the effect of buyback on the earnings per share was found to be positive by Horan (2012). This boosts the companies' accounting ratios, and the estimated stock price if one uses pricing models such as the dividend pricing model, as the earnings remain the same but those dividends are distributed amongst fewer shares.

The inability of investors to rapidly, fully incorporate information into price is a result of many reasons. Amini and Singal (2020) cite information asymmetry as one reason for the slow incorporation of market information. This is because information asymmetry causes uncertainty in determining a correct valuation for the firm, hence not every investor values the firm at the equilibrium price resulting in a slower price discovery. This is supported by findings in Leng and Noronha (2013) which indicates managers' private information is only partially revealed by the announcement of a buyback and the market may delay actions until further action by the company such as the actual repurchase to further interpret the private information.

Chan (2003) also finds that other factors such as transactional cost frictions and the inability of investors to completely understand news reduce the speed of information incorporation. Transactional costs like high shorting fees can discourage informed investors and result in slower price discovery. The inability of investors to grasp the complete extent of the news also results in mispricing.

We hypothesize that the risk-averse nature of the investors exacerbates this effect, as in a period of uncertainty about equilibrium price, a risk-averse investor would rather incorporate information slowly and be correct rather than take on risk by incorporating it very quickly and turn out to be incorrect.

3.2.2 Long-term effects of share buybacks

There exists extensive, contradictory literature regarding the long-term effects of share buybacks.

Studies to examine the long-term effects of share buybacks from over 30 countries have found supporting evidence for long-term abnormal returns and these long-term abnormal returns remain significant as recently as 2019 (Ikenberrya, Lakonishok & Vermaelen 1995; Manconi, Peyer & Vermaelen 2019).

On the other hand, share buybacks might indicate that a company has decreased investment into positive NPV projects; or has no positive NPV projects to invest in (Pham et al. 2020). Additionally, among S&P500 companies, managers' remuneration packages have seen share-based components double to 60% between 1992 and 2014 on average (Edmans, Fang & Huang 2017), myopic managers may opt to perform share buybacks to boost stock price in the short-term, at the expense of long-term investors, creating a moral hazard problem (Manconi, Peyer & Vermaelen 2019). These reasons support a lack of long-run abnormal returns, or significantly negative long-run abnormal returns such as those documented in Fu & Huang (2016) and Su & Lin (2012).

3.2.3 Decision to focus on short-term effects of share buybacks

In addition to the contradictory literature on the long-term effects of share buybacks discussed above, Kothari and Warner (1997) established that tests regarding multi-year abnormal security returns arising from prior corporate actions are severely misspecified and warned against taking conclusions from long-term studies at face value. Amini and Singal (2020) recognised this short-coming of long time period analyses, and opted for a short time period framework to avoid potential benchmarking issues or other issues linked with studies on long-term effects. Taking these factors into consideration, it is reasonable to look towards the short-term abnormal returns to find a profitable trading strategy around share buybacks.

3.3 Improvements over the public strategy

For the purposes of our study, the earnings announcement consideration in Amini and Singal (2020) is irrelevant. The upward drift as a result of buybacks is a result of buyback price impact and the slow incorporation of information by investors. Earnings announcements in Amini and Singal (2020) were only used as an indicator for the efficacy of incorporation of information disseminated in buybacks. Moreover, Amini and Singal documented the persistence of the post-buyback announcement upward drift, irrespective of whether the subsequent earnings

announcement contained a positive, neutral, or negative earnings surprise. Thus, abnormal returns because of this upward drift are observed irrespective of earnings announcements.

The public strategy includes filters to the equity universe in which a trading strategy is executed by filtering out firms with small market capitalisations(only including the top 75% firms by market cap) or announce a small buyback program(buying back less than 5%) etc. The robustness analysis conducted by Amini and Singal (2020) confirms that the discovered abnormal returns are neither driven nor hampered by extreme values for factors of market capitalisation and the size of share buybacks, hence we do not include filters for these in our strategy and hence avoid filtering out perfectly viable investment opportunities.

4. Proposed Strategy

Our proposed strategy is to react to buyback program announcements. We take a long position in the stock on the trading day subsequent to the announcement. At any given buyback announcement, we invest 1% of our total wealth in the position. We hold for a period of 60 days before closing the position.

We invest no more than 1% of our total wealth for two primary reasons. First, to minimize risk by having a diverse portfolio of stocks. Second, to ensure we have capital to invest in a buyback opportunity. Investing 1% in each buyback, we can hold 100 buyback stocks in any given 60-day period which roughly equals 600 buyback stocks held over a year. This is close to the empirical average number of buybacks in a year in the US equities market. We wished to use a general rule of thumb value instead of fine tuning using the results of the backtest to avoid multiple hypothesis testing which can lead to false discovery as described in Fabozzi and Prado (2018).

We chose a 60-day period based on the timespan tested by Amini and Singal (2020). They show that the abnormal returns results hold for a (-1, 30) day period around an earnings announcement with a buyback announcement anywhere from 2 to 30 days prior to earnings. This indicates that the longest duration to which we have data for abnormal returns is 60 days. It is possible that there are abnormal positive returns available to be captured after the 60 days, but this is not the focus of this paper and requires further investigation.

5. Methodology

This paper seeks to evaluate the short-term effects of trading on share repurchasing program announcements by taking a long position in securities traded on the US equities, for a period of 60 days beginning from the share repurchase announcement. To test this, we used quantopian as a backtesting tool and the following steps were followed to achieve the results.

5.1 Data Gathering

First, we needed share buyback announcements data for US Equities in the past 10-20 years. Unfortunately, the data was no longer available on Quantopian, so we used a third-party data service provider called Marketbeat which provided us with the required data from 01/01/2010 - 26/10/2020. The data we downloaded required a lot of pre-processing, so that we could use it in a pipeline of Quantopian.

5.2 Setup of 'The Beta Backtest'

This was the first backtest of our algorithm which followed the following conditions -

Table 1 – Conditions of the Beta backtest	
Testing period	01/01/2010 – 01/03/2011
Initial Cash	$100,000
Maximum position concentration	1%

The reason we used this testing period was because we wanted to do a test on a smaller period before using the entire dataset, hence we used the first year records from the data. The initial cash was set in such a way that it mimics the project conditions and we used a maximum position concentration to be 1% because we wanted to diversify our position and be able to participate in most of the buybacks as discussed earlier.

5.3 Quantopian shutdown

The Quantopian workstation was taken down on the 29/10/2020 and we could no longer develop our algorithm and debug our existing code. Regrettably, the results presented in the next section are preliminary and use "The Beta Backtest" as the algorithm's model which has some bugs which are discussed in the next sections.

6. Results

6.1 The actual results

The first backtest's results are as follows-

Table 2 – Results of the preliminary test	
Raw Returns	34%
Average 6 month rolling Sharpe ratio	2.08
S&P 500 returns	12.78%

The raw returns were promising and if we compare these results to S&P in the same period, we observe excess returns of 21.22%. The strategy also boasts of an average sharpe ratio of 2.08 which proves that the backtest yielded positive returns and the strategy is indeed profitable.

6.2 Bugs in 'The Beta Backtest'

a) Did not account for the case where cash available went below zero which implied, we borrowed at 0% and invested in the position which might cause inflation in the results
b) Secondly due to an one-off error we couldn't participate in positions that had buyback data on Thursday and Friday which hindered us from investing in some profitable trades
c) Lastly, we did not change the risk-free rate from 0 in the sharpe ratio calculation which quantopian uses as a default and this also contributed to the inflation in the returns.

6.3 Things we would have done if Quantopian did not shutdown on 29/10/2020

We identified the above-mentioned bugs in our testing phase and our next step was to remove them. So we planned to not invest in positions if we have negative cash available, thereby solving the first problem, after that we wanted to adjust data and/or algorithm to mitigate the one-off error so that we don't miss on some lucrative positions. Also, we decided to change the risk-free rate to the average T-bill returns over the tested period.

After successfully incorporating the above changes we wanted to test the strategy for its robustness by testing on various phases of the market. As 2010 was a bullish phase we can conclude that the strategy was profitable in the bullish phase but in a bearish market we concluded that the strategy would lose less money than investing in the market. The reason being our strategy had excess returns of 21.22% with respect to the market (from the results of the first backtest) and a similar trend was expected.

7. Extensions

7.1 Do Buyback Always indicate undervaluation?

In our research paper, we argued that buybacks indicate undervaluation, and we profit from the drift that arises because of it. But research from a recent paper presents an interesting detail in this hypothesis (Pham et al. 2020). This study shows that repurchase announcements that were preceded by SEOs of other firms in the same industry within the prior six months are more likely the result of lacking investment opportunities than signalling undervaluation, especially in concentrated industries. The reasoning behind this is straightforward i.e. if most of the companies in an industry are announcing SEO's implies that the industry does not have a lot of future prospects. So, if a company in this industry announces buyback, there are very strong chances that the managers want to achieve something other like boosting share prices artificially rather than buying undervalued stocks.

If we keep the above findings in mind we can improve our existing strategy by identifying industries that had a lot of SEO offerings in the past 6 months and thus filter out the stocks in these industries and not put any money in them even though they recently had a buyback announcement.

7.2 Capturing more abnormal returns from the buyback

In the earlier sections of the paper we discussed that we used 60 days as the holding period. This was because as explained earlier we only had results from Amini and Sighal, 2020 that confirmed abnormal returns were on the table for at least 60 days. But they did not check for longer holding periods and as an improvement to that we can check for extended periods and analyse the abnormal returns

8. Conclusion

The aim of our research paper was to find a public strategy, improve upon it and test its performance. We found a public strategy that utilised the positive signalling effects of share buybacks near an earnings announcement in the short-term to profit from the upward drift after a buyback. We improved this strategy by taking long positions in all stocks that announced buybacks as earnings announcements were found to be irrelevant. Although our results are preliminary, we can draw some tentative conclusions. The strategy seemed to perform well over a bullish period of 14 months, outperforming the S&P500 by 21.22%. The rigorous economic rationale provided for expected abnormal returns, allows us confidence in the efficacy of the strategy. This strategy can still be improved upon by accounting for less probable cases and informing the choice of parameters on further research.

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Appendix

```
"""
This is a template algorithm on Quantopian for you to adapt and fill in.
"""
import quantopian.algorithm as algo
from quantopian.pipeline import Pipeline
from quantopian.pipeline.data.builtin import USEquityPricing
from datetime import datetime
from quantopian.pipeline.filters import QTradableStocksUS

# Import the data we uploaded using Self-Serve Data feature of quantopian

# This is the data from the 01/01/2010 - 01/01/2011
from quantopian.pipeline.data.user_5eeab68125ede7003fd733b7 import buyback_2010

def initialize(context):
    """
    Called once at the start of the algorithm.
    """
    # Rebalance every day, 1 hour after market open.
    algo.schedule_function(
        rebalance,
        algo.date_rules.every_day(),
        algo.time_rules.market_open(hours=1),
    )
```

```
    # Record tracking variables at the end of each day.
    algo.schedule_function(
        record_vars,
        algo.date_rules.every_day(),
        algo.time_rules.market_close(),
    )

    # Create our dynamic stock selector.
    algo.attach_pipeline(make_pipeline(), 'pipeline')

    # Select the maximum position in a particular position = 1%
    context.max_position = 0.01

    # Store the orders that are currently held using their object id
    context.latest_orders = []

def make_pipeline():
    """
    A function to create our dynamic stock selector (pipeline). Documentation
    on pipeline can be found here:
    https://www.quantopian.com/help#pipeline-title
    """

    # Base universe set to the QTradableStocksUS
```

```
    base_universe = QTradableStocksUS()

    # Factor of yesterday's close price.
    yesterday_close = USEquityPricing.close.latest

    # The pipe is multi-indexed and has a single boolean column which
    # tells whether there was a buyback or not, on that particular date
    pipe = Pipeline(
        columns={
            'buyback_today': buyback_2010.buyback_announcement_today.latest
        },
    )

    return pipe


def before_trading_start(context, data):
    """
    Called every day before market open.
    """
    context.output = algo.pipeline_output('pipeline')

    # In this function I will update which stock/stocks I want to buy

    # These are the securities that we are interested in trading each day.
```

```
    req_stocks = []

    # Filter the stock that actually had a buyback announcement that day
    for index, row in context.output.iterrows():
        if row['buyback_today'] == True:
            req_stocks.append(index)



    # Update the security list based on the stocks we want to trade
    context.security_list = req_stocks



# the function buys the stocks based on the ticker id
# and updates the list of latest orders by adding the recently bought order
def buy_stocks(context, sid):

    # The functionality of trading with only positive cash remaining
    cash_remaining = context.portfolio.cash
    value = context.portfolio.portfolio_value * context.max_position
    if cash_remaining > value:
        order_id = order_value(sid, value)
        context.latest_orders.append(order_id)



# compute the difference between 2 dates in days
```

```
# the dates are passed in string of format YYYY-MM-DD
def days_between(d1, d2):
    d1 = datetime.strptime(d1, "%Y-%m-%d")
    d2 = datetime.strptime(d2, "%Y-%m-%d")
    return abs((d2 - d1).days)



# remove the orders from the current list that have already traded(sold)
def remove_orders(context, orders):
    context.latest_orders = list(set(context.latest_orders) - set(orders))



# Sell any stocks that finish their term of 60 days from
# the list of latest orders
def sell_stocks(context):
    # Store the list of orders to be deleted from the list of latest orders
    orders_to_remove = []
    for order_id in context.latest_orders:
        order_obj = get_order(order_id)
        order_date = str(order_obj.created)
        order_date = order_date.split(' ')[0]
        cur_date = str(get_datetime().date())

        # If the object is held for 60 more days then sell it
        if days_between(order_date, cur_date) >= 60:
```

```
            if order_obj.filled > 0:
                order(order_obj.sid, (-1 * order_obj.filled))
                orders_to_remove.append(order_id)


    remove_orders(context, orders_to_remove)


def rebalance(context, data):
    """
    Execute orders according to our schedule_function() timing.
    """

    # buy the stock which we want to trade
    for i in context.security_list:
        buy_stocks(context, i)


    # Sell the stocks that have reached the maturity of their holding period
    sell_stocks(context)


def record_vars(context, data):
    """
    Plot variables at the end of each day.
```

```
    """
    pass


def handle_data(context, data):
    """
    Called every minute.
    """
    pass
```