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A Primer on Pumping and Dumping: How Hedge Funds do it and How Others Might Profit

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ABSTRACT

Pumping and dumping occurs when the price of a stock is artificially inflated and then drops. Here, we illustrate how hedge funds can accomplish pumping and dumping, and argue why this strategy is likely to be successful for them. We illustrate why writing a short-term in-the-money covered call option might constitute an informed speculation when pumping and dumping is suspected. In contradistinction to the usual practice, estimating the returns of a strategy which is based upon the predictable characteristics of pumping and dumping would be best tested prospectively, and social media communities might fruitfully participate in such research.

Key words: covered call options, investment returns, pump and dump, social media communities

INTRODUCTION

Not all of the assertions on Reddit are nonsense. The prices of some stocks might actually be manipulated, protestations to the contrary notwithstanding. Even paranoids can have real enemies.

One form of market manipulation is "pumping and dumping", where the price of a stock is artificially inflated and then drops. Here, we illustrate one way by which pumping and dumping can be accomplished, and how this takes advantage of predictable characteristics of equity markets. We then describe how individual investors can attempt to profit from this behavior, and then finally discuss how the resulting trading strategy might be tested.

DEFINITION OF PUMP AND DUMP

A "pump and dump" is "a form of securities fraud that involves artificially inflating the price of an owned stock through false and misleading public statements, in order to sell the cheaply purchased stock at a higher price" [1]. Pumping and dumping can also refer to "manipulation" which might not reach the legal standard of fraud. For example, purchases (sales) of large volumes of stock can cause its price to rise (fall). Assertions can be made on social media which are indistinguishable from the usual speculative banter. This "non-criminal" version of pumping and dumping is of interest here. For concreteness, we assume that the pumper is a hedge fund which has sufficient resources to affect the price of the stock in the short term.

EXECUTING A PUMP AND DUMP: CONCEPTUAL RATIONALE

The pumper relies upon two relatively predictable characteristics of short-term market behavior. First, that price momentum, which can be induced by buying or selling large numbers

of shares, will continue beyond the initial pump. The rationale is that much of the buying will be done by entities whose incentives induce herd-following behavior (e.g., other hedge funds, momentum-based mutual funds) [2,3]. Second, while short-term stock prices are at least somewhat tethered to economic reality option prices are not, and instead are driven by the volatility in stock prices during the time frame under consideration [4]. The impact of this second characteristic is that, when either pumping or dumping takes place, inducing short-term volatility in stock prices, option premia will predictably spike.

EXECUTING A PUMP AND DUMP: REQUIREMENTS

To execute a pump and dump, the pumper must trade in sufficient volume to influence stock prices in the short term. An ideal stock to pump and dump is (1) highly speculative (and thus likely to attract the attention of other hedge funds); (2) has relatively few shares traded (thus allowing the pumper to affect the stock price without having to buy an excessive number of shares); (3) has a robust options market (as illustrated below); and (4) is widely discussed on social media (thus providing the pumper with a mechanism to influence opinions in the desired direction). Often, a "meme stock" will have all these characteristics.

EXECUTING A PUMP AND DUMP: IMPLEMENTATION

Table 1 below illustrates an idealized version of a pump and dump. For simplicity of exposition, we assume that the pumper doesn't engage in short selling at the apex. Buying is highlighted in yellow, selling is highlighted in green. Purple highlighting indicates the effective purchase price for an individual investor who purchases the stock and sells a covered call option. The time periods in question might extend across multiple calendar days.

- Period 0 is the steady-state for the stock price. During the previous time periods the pumper has accumulated short-term call options cheaply, the price being low because in the absence of extreme price moves they will expire worthless.
- Periods 1-4 represent the pumping of the stock price, induced by buying large numbers of shares even as the price increases, intended to induce momentum which in turn will encourage other momentum-oriented speculators to buy. This can be coordinated with a social media campaign.
- During period 5 the pumper moves into profit-taking mode. They try to sell incrementally, so as to induce others to continue buying. The implied volatility of the option contract is at a maximum.
- During period 6 the ruse becomes apparent, and the pumper sells aggressively even as the price drops.
- During periods 7-9 the stock price gradually returns towards its baseline. In the absence of pumping and dumping price volatility drops, as do option premia.
- Period 9 represents a new baseline for the stock price, perhaps a bit higher than the previous baseline, in part because of the expectation of another pump and dump.

Table 1: Illustration of an idealized pump and dump

Period	Stock price ($)	Short-term option @1 ($)	Effective purchase price after writing covered call @1	Short-term option @1.50 ($)	action
0	0.70	0.02	0.68	0.01	Accumulate options over time
1	0.80	0.04	0.76	0.02	Buy stock and options
2	0.90	0.07	0.83	0.04	Buy stock and options
3	1.00	0.10	0.90	0.07	Buy stock
4	1.20	0.35	0.85	0.15	Buy stock
5	1.40	0.60	0.80	0.30	Sell stock and options incrementally
6	1.20	0.35	0.85	0.20	Sell stock and options aggressively
7	1.10	0.20	0.90	0.10	None
8	1.00	0.10	0.90	0.07	None
9	0.90	0.05	0.85	0.03	New baseline

The profits to the pumper are as follows: (1) on the stock, bought at $0.80-$1.20 and sold for $1.20-$1.40; (2) on the $1 call option, bought at $0.02-$0.07 and sold for $0.30-$0.60; (3) on the $1.50 call option, bought at $0.01-$0.04 and sold for $0.20-$0.30. The stock profits are derived by inducing momentum and then leaving the party early. The option profits for the $1 call options are derived from a combination of increasing intrinsic value and increasing implied volatility. For example, at period 5 the option premium of $0.60 consists of $0.40 in intrinsic value (i.e., the difference between the current stock price and the option strike price of $1.00) and $0.20 in implied volatility (i.e., which is maximized at this point because of the recent volatility in the price of the underlying stock). The option profits for the $1.50 call options are entirely derived from an increase in implied volatility. The percentage gains on the option trades are significantly greater than on the stock trades, although the latter are consequential as well.

PROFITING FROM A PUMP AND DUMP

The individual investor is at a significant disadvantage throughout this process, in large part because they cannot predict precisely when the pump and dump will either begin or end. For example, when the stock price has risen to $1.20 it is uncertain whether the price will rise to $1.40 (or more) and then fall, or instead whether this is the apex and the next move is downward. Predicting the next stock which will be pumped -- in effect, attempting to buy the stock on period 0 -- is a guessing game, which serves to bid up the prices of potential candidates and ultimately reduce profits -- not even to mention the possibility that hedge fund managers might simply find other kinds of stocks to pump and dump. Buying short-term call options (i.e., which generate the maximum return on a percentage basis) runs the risk of the pump being delayed and having the options expire worthless.

Given the idealized description of a pump and dump illustrated by Table 1, there are various points at which an individual investor could profit -- in essence, by buying up to $1.40 and

selling thereafter -- but most of these essentially require that they either buy an overpriced stock or buy an option which might expire worthless, both of which are self-evidently dangerous. We would argue that the safest speculative bet is to write a short-term in-the-money covered call, as illustrated by the middle column of Table 1. (The entries in this column begin when the investor could realistically identify the pumping, and end when it is clear that the dumping has started.) Writing such a call recognizes that the stock price is being pumped, and that it is likely to eventually settle on a value which is only modestly above its initial baseline.

For example, during period 5 the investor could buy the stock for $1.40 and sell a $1 call option for $0.60, thus reducing their effective purchase price to $0.80. They hope that the stock price will be above $1.00 on the option expiration date, in which case the stock will be called away, and their return is 25% (i.e., $0.20/$0.80). Similarly, if the buy-write is made on periods 4 or 6 then their return is 17.6%. The maximum possible return for a covered call is at the height of the pumping frenzy, because of the increase in implied volatility. The main risk is that the stock price might plummet below the effective purchase price.

Testing

Investment strategies are usually tested by translating them into algorithms, and applying these algorithms to historical databases. For example, all stocks satisfying the criterion of the algorithm on January 1 of year 1 would be purchased, held for 365 days and then sold, an annual return calculated, the process repeated on January 1 of year 2, etc. The primary and often decisive advantage of this approach is that many years of data can be analyzed without having to wait for that amount of time to actually pass. The primary and quite significant disadvantage of this approach is that, even with an accurate historical database, the algorithm might be a pale imitation of how a human would actually implement the strategy in question [5].

A particularly challenging aspect of using a historical database to estimate returns of a pump and dump strategy involves distinguishing between a pump and dump and the response to significant corporate news. In this latter case, the initial buying could reflect anticipation of good news, the frenzy could reflect reaction and then overreaction to that news, and the subsequent drop in price could reflect correction to the overreaction and profit taking. Moreover, daily option prices would be required.

Fortunately, the timeframe from the beginning of a pump and dump to its conclusion is sufficiently short that a prospective approach might be used instead. For example, returns might be estimated using a prospective database. To create the database the researcher would annotate their trades in real time and record the results. In actual practice, the strategy in question could be implemented mostly but not entirely by algorithm, and so what would be tested is a combination of both the strategy and the investor's skill in its implementation. If multiple investors contribute to the database these two effects could be disentangled. As a quality assurance measure, the rationale for each trade could be recorded, thus providing qualitative information about fidelity to the trading strategy, and also an indication of how much judgment is required to actually implement it.

DISCUSSION

The efficient market hypothesis, in effect, simply assumes away the possibility that stocks can be pumped and dumped [6], although this does not prevent the phenomenon from occurring. In theory, any predictable pattern of stock prices suggests that superior risk-adjusted returns could potentially be obtained by taking advantage of that pattern, pumping and dumping included. However, because the pumper controls the timing of events, it is difficult to safely take advantage of this phenomenon, and we propose that writing an in-the-money covered call option might nevertheless represent a plausible speculation.

The legally fraudulent version of pumping and dumping often takes place within the context of "penny stocks", and is manifested differently from the above as the time period is longer, there is unlikely to be an options market, and the group left holding the bag are poorly informed individual investors. In contrast, the larger-scale pumping and dumping illustrated here is essentially a zero-sum game where some large speculators profit from other large speculators (e.g., the volume of shares being rapidly traded is too large for the phenomenon to be significantly impacted by individual investors). Here, we judge neither legality nor ethics, instead take the position of Godfather Vito Corleone: "it doesn't make any difference to me what a man does for a living" [7], and simply inquire whether this somewhat predictable behavior can be profitably exploited.

The idealized version of a pump and dump illustrated here was based on Sundial Growers, which is a meme stock within the cannabis sector, during June 2021. No one is requiring that inexperienced investors purchase meme stocks and, indeed, when an individual investor tries to outsmart a professional speculator and things go poorly the speculator isn't the one to blame. At the circus you can safely visit the animal exhibits, enjoy the rides, and try the food -- if you instead decide to visit the freak show that's on you.

In contradistinction to the usual methods for testing investment strategies, we have argued that the above strategy of combatting pumping and dumping would be best tested prospectively, which also serves as a reminder that the typical procedure of relying upon historical databases is based upon necessity rather than preference. Such prospective database would essentially take the idea of a "trading journal" used by individual investors and extend it to groups of people performing collaborative research on an investment strategy of mutual interest. It would also avoid the selective reporting which is a hallmark of social media. Rather like the internet has served to democratize knowledge, creating such a database could be a way to democratize research on the short-term behavior of stock prices. Moreover, for its participants it might be a more productive (albeit perhaps less enjoyable) use of time than writing commentaries about apes with diamond hands.

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