The Stock Split Temptation!

Since the demise of fixed commission prices in recent years, as stock splits don't seem to offer any real benefit to investors, they have become quite rare. However, between July and August 2020 two major companies, namely, Apple and Tesla announced a 4-for-1 and a 5-for-1 split respectively. Logically, splits do not represent significant changes for a company apart from reduced stock prices as the number of shares is increased. As one would expect, since a company's financial credentials on the balance sheet remain the same, the value and attractiveness of a particular stock to a potential investor should stay unchanged as well.

Daniele Melotti

danielemelotti@hotmail.com

Uniwersytet Ekonomiczny w Poznaniu
kierunek: Financial Engineering
II rok, II stopień

Opiekun naukowy:
dr hab. Tomasz Jewartowski, prof. UEP

Artykuł recenzowany

Vijayant Mehla

vijayantmehla@gmail.com

Uniwersytet Ekonomiczny w Poznaniu
kierunek: Financial Engineering
II rok, II stopień

Opiekun naukowy:
dr hab. Tomasz Jewartowski, prof. UEP

Artykuł recenzowany

However, this claim does not reflect well with reality. Apple and Tesla's stock prices literally boomed after the announcement of the split, providing an opportunity to achieve abnormal above-the-market average returns. Tesla's shares gained more than 38% in just 20 days within the announcement of the split and its execution, while Apple added an enormous $560 billion in less than a month.

Splits often lead to the creation of so-called "False alpha", where the prices of stocks go up for no visible reason leading to the often quoted phenomenon of a "bubble" in financial markets. Following the ideal that stock splits are nothing more than cosmetic procedures to increase a company's stock appeal, as nothing on a company's financials apart from the number of shares on the market changes, sooner or later the bubble is bound to burst.

We will talk of probable reasons for the creation of this false alpha, explain consequences of stock splits and observe if, and when investing in stock splits can be a profitable strategy.

Understanding Stock Splits

Forward stock splits, also known simply as stock splits, are literally a stocks' division, which happens when a company's board of directors issues more shares of stock to its current shareholders without diluting the value of their stakes. Stock splits increase the number of shares outstanding and lower the individual value of each share. For instance,

assume that you are a private investor in possession of one share of a company, worth $100. If the denoted company opts for a 2-for-1 stock split, that would grant you an additional share, but each share would be valued half the amount of the original, namely the new value of a singular share would be $50. After the split, the sum of the two shares would be worth the same as the one share you had started with, which is $100. Therefore, when a split happens the number of shares is inversely proportional to their value; double the number of stocks, halve their value. Of course, 2-for-1 splits are not the only possible type of splits; there exist also 3-for-1 splits, 4-for-1, and so on.

There also exist reverse stock splits, which happen with an inverse procedure. Coherently with the previous example, assuming that a company would go for a 1-for-2 split and you owned 2 shares worth $50 each, you would find yourself with 1 stock worth $100 after the split becomes effective.

What are the reasons for splitting stocks?

In the past, many companies used to split their stocks regularly in order to keep their share prices within a certain range, conventionally below $200. Coca-Cola split its shares on 9 different occasions since 1960, which today amounts to a 1152-to-1 multiplication of its shares, pointing out how the world's most famous beverage company increased in value tremendously. Stock splits once symbolized companies' operational strength and confidence in a continuing upward trend in share prices, but in the last years they have become less and less frequent. There were stronger reasons to act in the heyday of stock splits. Besides keeping the price low, making it easier for retail investors to buy a small number of shares, splits also had the effect of reducing stock trading commissions for smaller investors.

Between 1980 and 2010, there have been approximately 5000 stock splits only in the US, providing an average of 161 splits per year. As visible in Figure 1, the S&P 500 index alone recorded an approximate 1500 splits between 1980 and 2010, while in the following ten years the total number of splits equalled a shallow 67 (Calhoun, 2020).

Splits used to happen so often that before 2007 it was rare for the S&P 500 to have more than a few stocks over $100. Now instead, there are more than 100 stocks trading beyond this price (Mackintosh, 2020).

Stock splits' prime time attractions have waned as commission-free trading platforms and fractional shares made it easy for small investors to put as much cash as they want on their favouri-

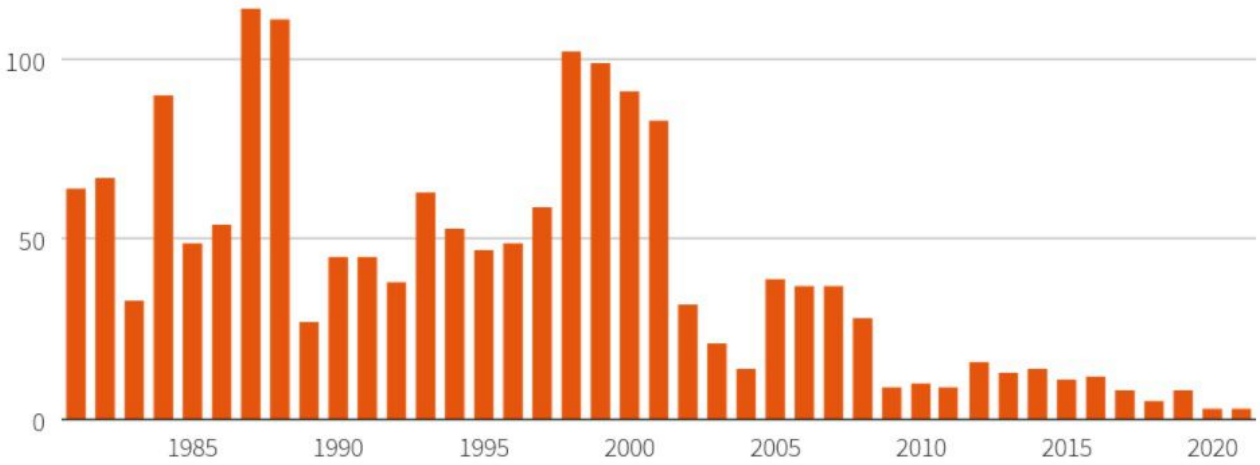

***Figure 1:** An illustration of the number of stock splits performed by S&P 500 companies every year between 1980 and 2020*

Source: Randewich and Patnaik, 2020

te stocks. Markets change, and so do change the necessities and actions of the companies and investors involved.

Perhaps, there is a correlation between the start of the current bullish market, since 2008, and the strong reduction in stock splits. Nonetheless, how is it possible that during the previous bullish market, from 1998 to 2000, the average number of stock splits on S&P 500 was 91? Even before, from 1987 to 1990, there was an average of 57 splits per year, which is still far higher than last years' standards (Grant, 2018).

The drawdown in stock splits has been driven by the very nature of individual investing. Smaller investors started using funds and ETFs more, and the structure of commissions individual investors pay has changed in a way that the number of shares being bought or sold does not impact the transaction cost (Grant, 2018).

Evidence of such intentions is given by Apple's split in 2014. The company shares traded as high as about $700 apiece, making them difficult to access for the everyday investor. At the time of the split, Apple CEO Tim Cook publicly affirmed that the split was executed in order to make shares available to a wider range of investors (Sparks, 2020). Making a price more attractive and attainable for a larger audience means creating more liquidity, which is one of the objectives that stock splitting companies aim at. As shown in the study by Maloney and Mulherin (2009), liquidity improvements that follow splits reduced average companies cost of equity capital by 17.3%. One more reason why management of some companies may decide to perform splits, is to create stock options for their employees, without diluting their own share so as to relieve the agency problem (Mackintosh, 2019).

The opposite can happen too, namely when companies are concerned that their share price is too low, then they can opt for a reverse stock split. Reverse stock splits are often aimed at helping a company meet the minimum requirements to remain listed on an exchange. A reverse stock split consolidates a company's shares in a way that results in a higher per-share price that can keep trading on a public and accessible exchange (Marquit and Schmidt, 2020).

Stock splits act like indicators and send a positive message to investors, expressing a bullish management sentiment, and strong optimistic expectations for future growth from the companies' side. According to Mackintosh (2020), large-cap stocks which perform splits consistently outperform the market by an average 5% over the next year. However, many experts and journalists claim that splits don't change anything fundamentally about a com-

pany or its valuation (Calhoun, 2020) and should not have any effect on company value. Also, in an efficient market, there should neither be an "alpha" to exploit, nor a chance for investors to profit. Then, why do so many investors consider investing in split stocks a profitable strategy, bumping up the interest in the market and thus the prices for them?

Apple and Tesla's Case

As we have seen in the recent decade, increasingly many companies don't bother to split, or don't want to. It seems that hitting the conventional $200 barrier is no more a prime reason for splitting. For instance, Amazon trades now at $3180 a share, Google at $1800, the American homebuilder NVR at $3920. Somewhat lower, but well above the traditional price levels that in the past would have triggered a split, there are many other companies, such as Netflix ($512), Nvidia ($534) and BlackRock ($713).

Someone decided to come out of the herd and invert the trend though. Two of the main companies behind Wall Street's great coronavirus rally of 2020 recently put the issue of stock splits back on the corporate agenda. On July 30th, Apple announced a 4-for-1 split, Tesla followed on August 11th with the announcement of a 5-for-1 split. Their moves have brought attention to an idea that had largely fallen out of corporate fashion.

The consequences were impressive, as Apple added approximately $560 billion in value in less than a month after the split announcement, while Tesla's shares gained over 38% in only the 20 days between the announcement and the execution of the split.

The day after the announcement, AAPL stock closed more than 9% above the price it closed the day before the announcement.

The stock started trading on a split-adjusted basis on August 28th, and on that day, closed 26% higher than the closing price on the day before the split announcement, versus the S&P 500 up only 7% over the same period. As shown in Figure 2, the period between the announcement date and the split execution date has provided an almost vertical growth in prices, offering a chance for significant returns. The trend was kept for the few

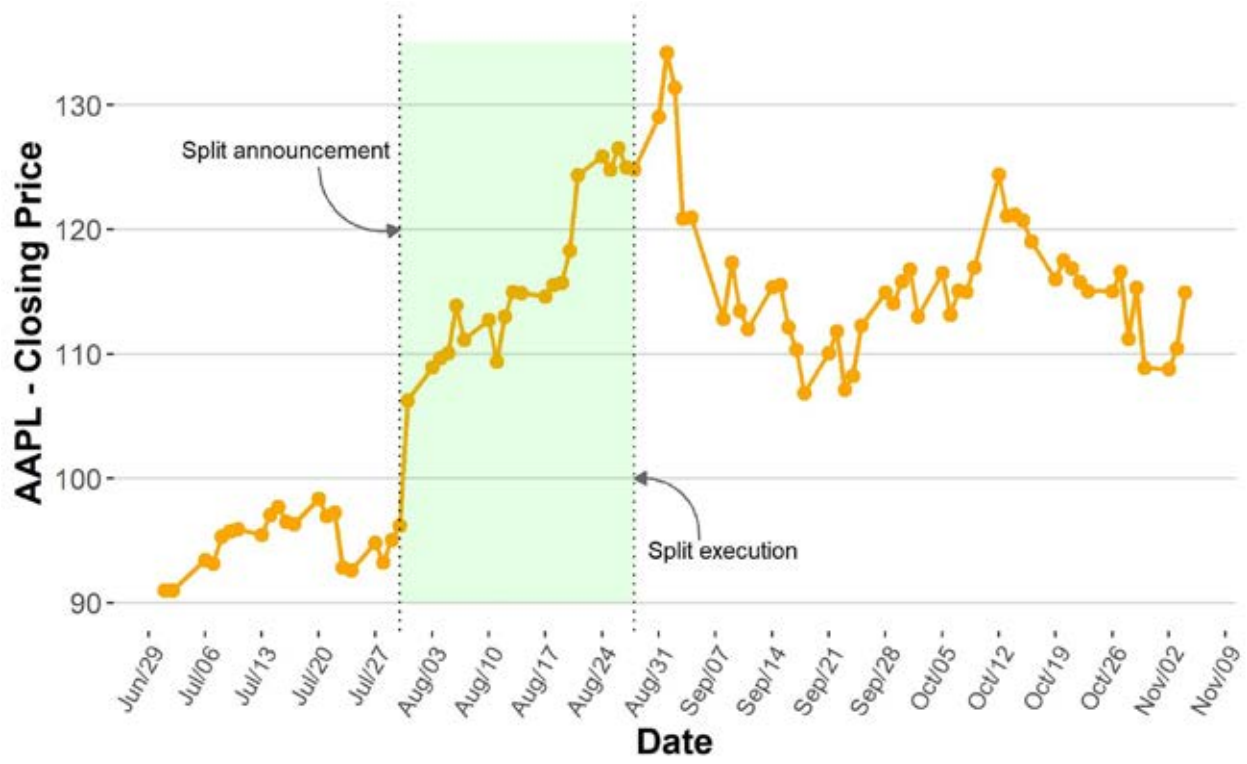

***Figure 2:** The evolution of AAPL stock prices between July 1st and November 5th*

Source: Own elaboration

days after the execution date and then a pullback was observed.

In Tesla's case, the stock began trading on a split-adjusted basis on August 31st, only 20 days after the split was announced. As for AAPL, making stock ownership more accessible to employees and investors was cited as the reason for the split (Gayed, 2020). At close, on August 31st, the stock was 38% higher, on a split-adjusted basis, than the day before the announcement, while the S&P 500 rose only 4% over the same period. The TSLA stock ride can be seen in Figure 3. It's visible that after the fertile period between split announcement and split execution date, a pullback was observed, as in the case of Apple.

The action by two stock market favourites definitely led many other companies to look into the issue and ask whether they should follow suit (Waters, 2020). However, after Apple and Tesla only 9 NASDAQ listed companies announced stock splits in the following three months.

For the case of the two giants, it is true that prices have gone up after the split was announced, but that has not much to do with the splits themselves. Rather, it reflected the continued success of the companies, which was already shown in the high share prices that led to the splits in first place (Waters, 2020).

There may still be psychological advantages to making it easier for individuals to own whole shares in the companies they observe (Waters, 2020). Splits play on the emotions of investors, having a huge impact from a psychological perspective. It could result in a temporary lift as more retail investors are drawn in (Waters, 2020). Active stock traders looking to profit from the momentum behind stocks such as Tesla may then accentuate the movement, though the effects are likely to dissipate after a short-term bump.

Stock splits are rather tricky strategies to execute. The American food company McCormick announced a 2-for-1 split on September 29th this year, with the stock trading under the split-adjusted price starting on December 1st. With the stock price having briefly pushed above the $200 mark in the beginning of August, the board of directors apparently took action to prevent McCormick shares

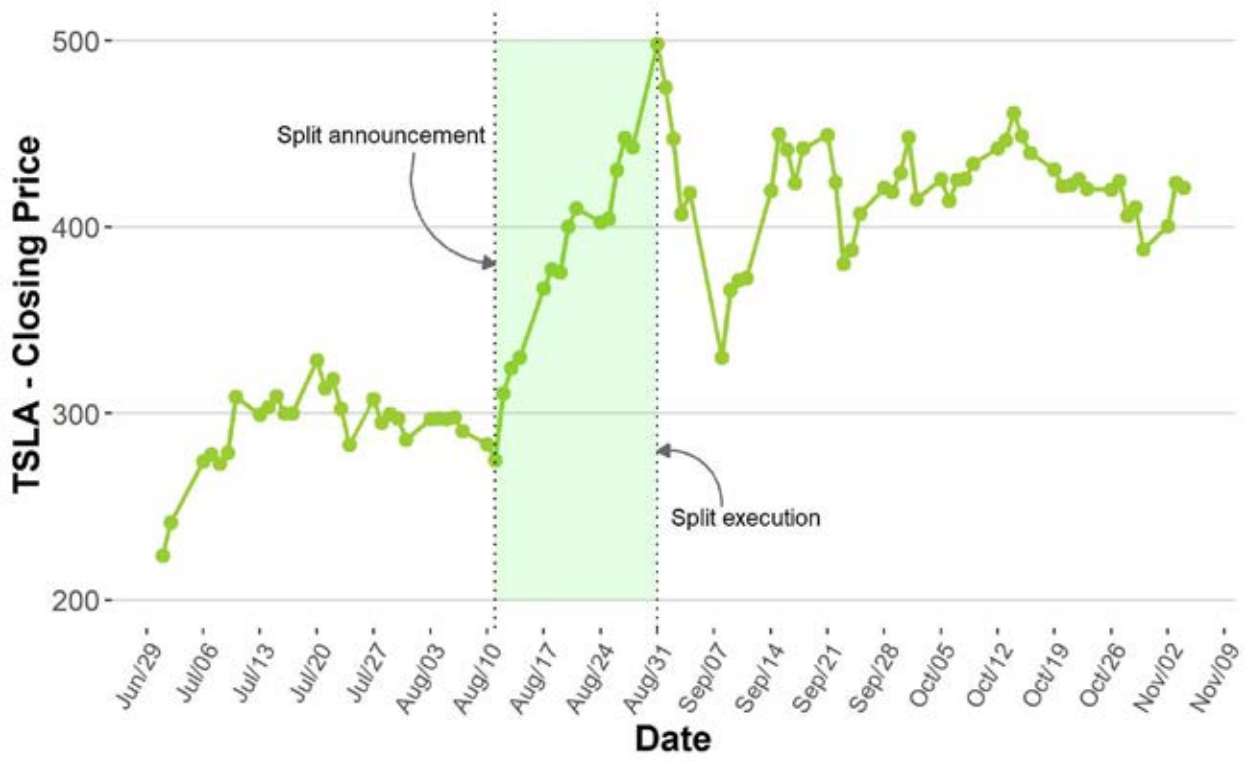

***Figure 3:** The evolution of TSLA stock prices between July 1st and November 5th*

Source: Own elaboration

from getting too pricey. As shown in Figure 4, the response was not like the one in the case of Apple and Tesla, their stock prices rather fell flat, despite having solid quarterly results and 8% increased sales than the last year (Caplinger, 2020).

Some would have expected McCormick stock to rise solely because of its stock split announcement. But the experience of the past couple of months might well be a reminder of the uncertain impact that splits have.

To Invest, or Not to Invest?

If you assume that you were owning the shares of a company before the split happened, then the underlying value of your investment would remain unchanged, as only the number of your shares would be multiplicated. But assuming that you are not a shareholder yet, a split might motivate you to buy and become one.

An Apple's stock trading at 500$ might not be an easy reach for every investor on the market, however, if the same stock cost 125$, many more would find it affordable. Moreover, when share prices are lower, portfolio managers find it easier to sell shares in order to buy new ones (Marquit and Schmidt, 2020). Each trade involves a smaller percentage of the portfolio.

The opportunity for more people to buy a stock could bump up its price, and this could lead to the company's temporary increase in value (Marquit and Schmidt, 2020). Splits make it easier for investors to buy shares, which generates more demand, leading to higher share price. But to see long-term gains, one would need to keep holding those shares to get the benefit over time.

Generally, when the news of a stock splitting comes on newspapers, many investors want to jump in thinking that owning a stock right before it splits means that they will be getting more than they paid for. Although, it remains a risky undertaking (Equities news, 2020). On the other hand, there are concrete chances of obtaining a quick short-term gain after a stock split, but this usually happens once in a while with stocks that everyone wants to own.

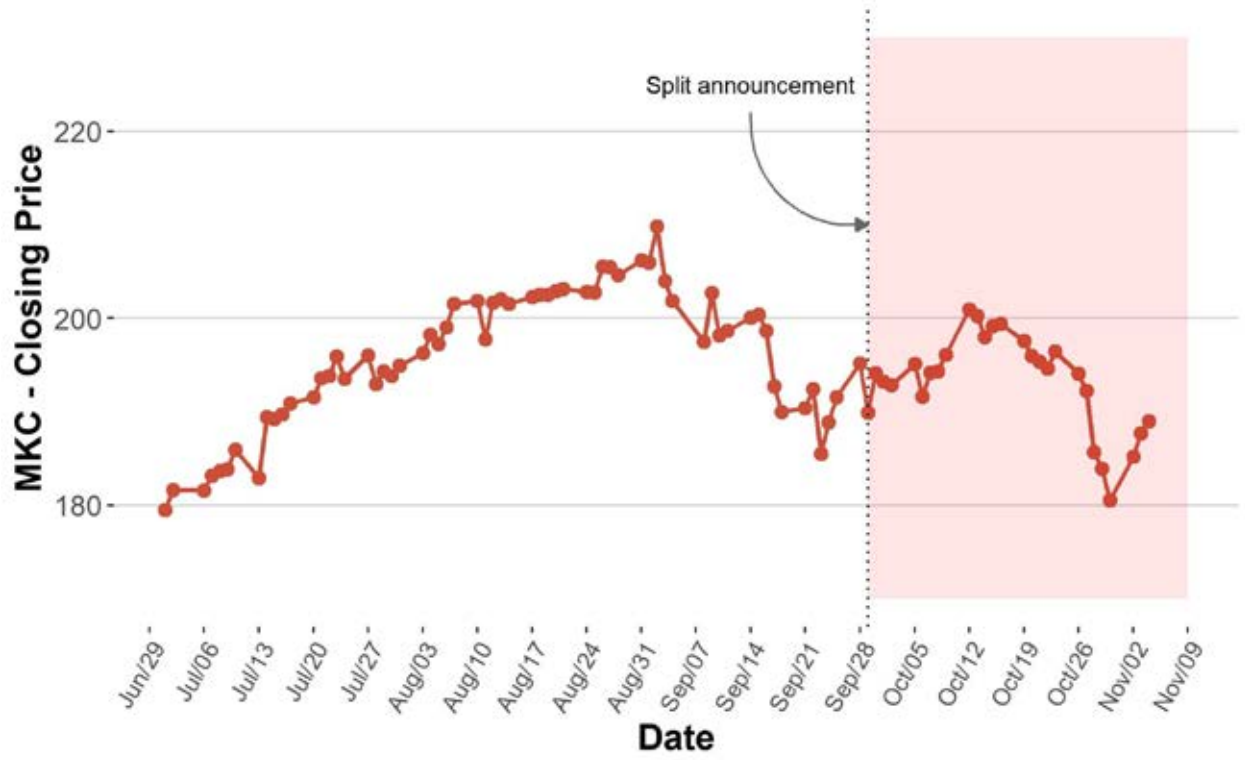

***Figure 4:** The evolution of MKC stock price between July 1st and November 5th*

Source: Own elaboration

Correlation between split stocks returns and market capitalization

It has already been stated that theoretically a stock split should make no difference to the attractiveness of a company's shares. Other things being equal, the nominal price of the stock should fall to reflect the increased number of shares in issue. But the psychological effects are less predictable.

Academic research has long pointed to superior stock market returns from companies that split their shares. Two studies from the mid-1970s to 2003, for instance, highlighted an excess return of 8 per cent in the first year after a split, extending to 12-16 per cent over three years (Waters, 2020).

Inspired from this we decided to conduct our own research on the matter. Focusing on the NASDAQ index, we collected information regarding companies that performed splits in the first three quarters of 2020 (see Table 1).

We took into account the dates of announcement and execution of the splits and researched adjusted closing prices at the mentioned dates. This timespan was chosen specifically to keep the influence of other factors apart from the news of stock split to minimum, so that the effect of what just the news of stock split leads to could be observed. This allowed us to calculate the overall returns for the period between announcement and execution of the splits. Afterwards the market capitalization

Table 1: Regression database

Ticker	Ratio	Announcement Date	Price (Ann.)	Execution Date	Price (Ex.)	Market Cap (Ex.)	Return
CNNB	1.6351-for-1	2020.01.22	$10,89	2020.01.23	$10,83	$32 273 400,00	-0,55%
PKBK	11-for-10	2020.02.03	$19,73	2020.02.14	$21,51	$254 893 500,00	8,28%
AYRO	2-for-1	2020.05.28	$3,90	2020.05.29	$3,05	$38 064 000,00	-27,87%
BKCC	1.029-for-1	2020.05.06	$2,73	2020.05.29	$2,71	$190 160 700,00	-0,74%
RAND	1.589-for-1	2020.03.04	$26,10	2020.05.12	$17,64	$45 687 600,00	-47,96%
HWBK	1.040-for-1	2020.05.08	$17,00	2020.06.12	$18,75	$121 687 500,00	9,33%
HOFV	1.4213-for-1	2020.07.01	$12,00	2020.07.02	$9,26	$294 653 200,00	-29,59%
IAC	3.054-for-1	2020.06.30	$105,89	2020.07.01	$106,71	$8 466 371 400,00	0,77%
AAPL	4-for-1	2020.07.30	$96,19	2020.08.31	$129,04	$2 206 584 000 000,00	25,46%
CLAR	1.002-for-1	2020.08.04	$12,20	2020.08.07	$13,09	$392 045 500,00	6,80%
GLPI	1.012-for-1	2020.08.07	$38,88	2020.08.14	$37,44	$8 263 382 400,00	-3,85%
MRTN	3-for-2	2020.07.17	$19,09	2020.08.14	$18,60	$1 537 476 000,00	-2,63%
POWI	2-for-1	2020.07.30	$62,81	2020.08.19	$57,30	$3 424 821 000,00	-9,62%
TSLA	5-for-1	2020.08.12	$310,95	2020.08.31	$498,32	$464 339 559 200,00	37,60%
AROW	1.030-for-1	2020.08.27	$28,40	2020.09.16	$27,27	$421 866 900,00	-4,14%
TREX	2-for-1	2020.08.03	$72,25	2020.09.15	$69,88	$8 089 308 800,00	-3,39%

Legend: Returns above 5% | Returns between -5% and 5% | Returns below -5%

Source: Own elaboration on the base of https://finance.yahoo.com

of each of the considered companies was used to distinguish them between large-cap, mid-cap and small-cap companies. Such distinction was made according to the following standards:

- Companies with market capitalization above $10 billion are large-cap companies,
- Companies with market capitalization between $2 billion and $10 billion are mid-cap companies,
- Companies with market capitalization lower than $2 billion are small-cap companies.

Then, using SPSS software, we created two dichotomized variables on the base of market capitalization, in order to categorize companies into the 3 groups described above. Finally, we performed a multiple regression by entering method, setting the returns as the dependent variable, and the dichotomized variables as independent variables. As visible from the value of R Square in Figure 5 the model is able to explain 43.8% of the variation of returns.

The outcome of ANOVA, visible in Figure 6, is quite encouraging. As the p-value is 0.024, the null hypothesis, stating that all the coefficients of the model are equal to zero, can be rejected.

The final, and most important output obtained is the coefficients table, shown in Figure 7. This table presents the most important findings of the regression. The variable for large-cap companies is statistically significant; its value, 40.437, indicates the ability of large-cap companies' stocks to obtain on average 40.44% higher returns than mid-cap and small-cap companies. Furthermore, the Pearson's coefficient of correlation between returns and large-cap companies is quite high (0.677), indicating a moderately strong and positive correlation between the two variables. Regarding mid-cap companies, we can see that such companies performed 4.89% better than small-cap companies and that the correlation between returns and mid-caps is only 0.107, however, the coefficient is not statistically significant, hence irrelevant.

The outcome of the regression allows us to say that the news of stock splits is considered a positive signal by the market for successful higher capitalization companies. This positive signal leads to investors buying the stock and bumping up its price, which tends to reflect higher returns in the time frame between split announcement and execution, while the same is not true for mid-cap and small-cap companies. Since the increased prices are not an outcome of changes in the fundamental functioning of the company, they are rather not permanent, however they don't die out so quickly either, thus creating a 'false alpha' in the market.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.662[a]	.438	.351	16.44093%

a. Predictors: (Constant), Mid_Cap, Large_Cap

Figure 5: Model Summary

Source: Own elaboration

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2735.523	2	1367.762	5.060	.024[b]
	Residual	3513.952	13	270.304		
	Total	6249.475	15			

a. Dependent Variable: Return

b. Predictors: (Constant), Mid_Cap, Large_Cap

Figure 6. ANOVA's outcome

Source: Own elaboration

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-8.908	5.199		-1.713	.110
	Large_Cap	40.437	12.735	.677	3.175	.007
	Mid_Cap	4.887	9.727	.107	.502	.624

a. Dependent Variable: Return

Figure 7. Coefficients table

Source: Own elaboration

Certainly because of this investing behavior, one can expect increased volatility post split and it sums up to the idea mentioned before that investing in stock splits can be a profitable strategy, if one bases their decision on a company's underlying financial health and past momentum.

Analyzing for the long-term horizon, numerous academic studies done over decades on thousands of stock-splits confirm the phenomenon of stock-split alpha, where just the event of a split can drive up a stock's price. These above-market returns could persist, sometimes even for long periods (up to three years) (Chen, Hguyen and Singal, 2011).

An interesting newsletter, 2-for-1.com, follows this phenomenon and strictly invests in split stocks. The brain behind this, Neal Macneale, can boast a 1291.09% overall return over 24 years, or 11.51% annualized, as of 9/30/2020 [2-for-1, 2020].

In 2013, the Wall Street Journal ran a backtest of the stock-split signal vs the market. It found out that a portfolio owning companies whose stocks had split over the previous ten years, and holding them for 30 months, produced an annualized return of 14%, compared to 8% for the S&P 500 over the same period (Hulbert, 2013). That is about 600 basis points of alpha, in line with the studies shown in Figure 8.

In short, stock-splits often create a pattern of above-market returns, real "alpha". They are easy to spot and exploit, and are strong and long-lasting enough to be profitable, even if investors only make their move after the splits have been publicly announced.

Stock Splits and Insider Trading

Stock splits are an interesting corporate event, because the decision to split is both the consequence of a rise in stock price and a probable cause for a further increase in the stock price. Both the positive announcement effect and the stock appreciation before the announcement can motivate insiders to trade their stocks. If insiders can accurately predict the announcement effect and try to maximize their trading profits, it would be expected to see more insiders buying before stock split announcements and more insider sales after stock split announcements. However, the existence of stringent government regulation against illegal insider trading will surely reduce, if not eliminate, the level of abnormal insider trading activities. For example, to circumvent the regulations, insiders could delay sales until after the announcement to profit from the positive announcement period abnormal returns. On the other

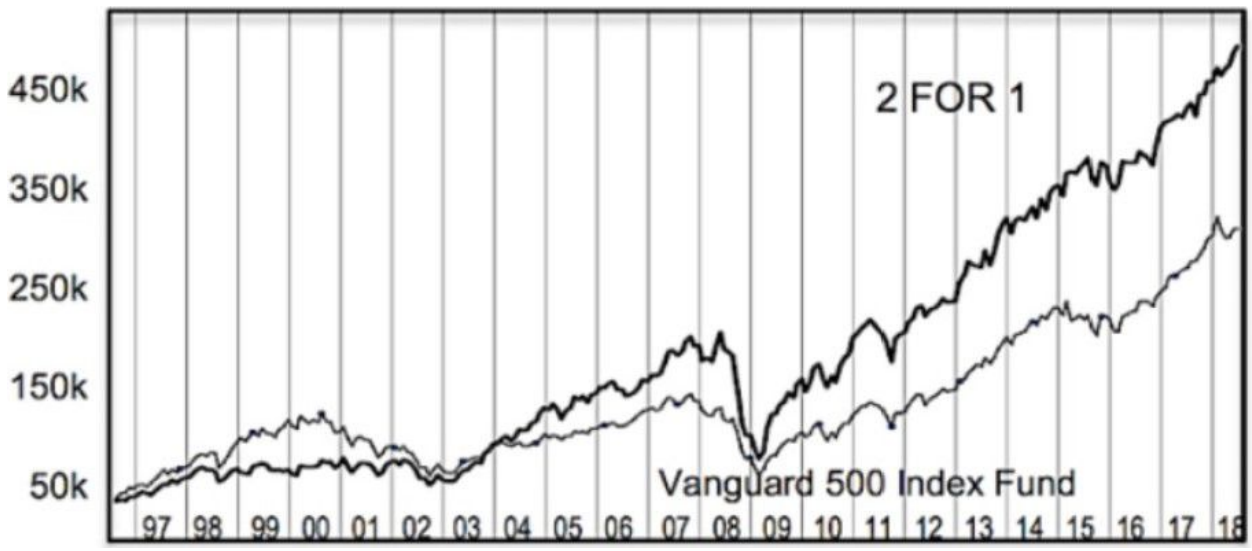

***Figure 8:** An illustration of Neil Macneale's portfolio performance achieved by strictly investing into split stocks vs Vanguard 500 Index fund every year between 1997 and 2018*

Source: 2-for-1.com, 2020

hand, if insiders are motivated mainly by other reasons, such as portfolio diversification purposes or personal financial needs, insiders may sell more shares prior to the stock split announcement when the stock price is in a relatively run-up status.

There are relatively fewer insider purchases and more insider sales during the periods before than the periods after split announcement (Ma, Sun and Yur--Austin, 2000). The larger the pre-announcement period abnormal returns, the larger the pre-announcement period insider purchases and the smaller the pre-announcement period insider sales. This suggests that the main motive behind insider trading activities around stock split announcements is not the announcement period abnormal returns. Rather, the pre-announcement stock performance is the dominant factor explaining abnormal insider trading behaviour around stock split announcements.

Especially in emerging stock markets, with lax laws surrounding the functioning of MNCs, often stock splits are found to have close correlation with companies vulnerable to illegal insider trading. (Nguyen, Tran, and Zeckhauser R. 2012)

Summary

Theoretically, splits should not matter. At best, they are just a signal of upcoming increased volatility. Under current market conditions, with new investors flooding the market, the technicals are surpassing the fundamentals. The rise in popularity of online brokers, has resulted in more marginal buyers. These new market participants treat stock trading more akin to gambling and facilitate the spread of false information. And this puzzle of stock splits

only adds to the existing complexity of the investing dynamic.

Typically, stock splits will likely be less common than in the past market expansions as now there are more flexible ways to trade. Some valuable stocks, for example Berkshire Hathaway Inc., famously never split. But for the nimble investor, stock splits can provide a quick entry and exit opportunity to execute gains in the market.

One may try to play safe by investing in stocks with a high price momentum, and benefit from the forecasted increase in volatility. Our research points out a moderately strong and positive correlation between stock returns and large-cap companies' market capitalization, indicating 40.44% higher returns when compared to mid- and small-cap stock splitting companies, in the time-span between announcement and execution. This research definitely has room for improvement, as it was implemented on a limited dataset, and in a year troubled by Coronavirus which had a strong impact on the market volatility. Going by the academic and empirical research performed on the matter, we could still say that the existence of market alphas post stock splits is real, easy to spot and could potentially be exploited by the nuanced investor. Nevertheless, because of their reputation and design, stock splits will remain a risky gamble for investors to play for years to come!

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