

# **THE BREWS AND THE BULLS: EXPLORING THE ALE-PHABET SOUP OF BREWERIES AND BOEING'S STOCK PRICE**

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This research examines the frothy relationship between the number of breweries in the United States and Boeing's stock price (BA). Utilizing data from the Brewers Association and LSEG Analytics (Refinitiv) from 2002 to 2022, our study revealed a striking correlation coefficient of 0.9103156 and a statistically significant p-value of less than 0.01. Our findings suggest a robust association between the burgeoning craft beer industry and the fluctuations in Boeing's stock prices. We delve into the hoppy conundrum of causality and consider potential implications for investors seeking to tap into this unexpected relationship. Our analysis sheds light on the unforeseen interplay between the hops in beer and the highs and lows of stock market performance, offering a spirited approach to understanding economic trends and market dynamics.

## Introduction

Pour yourself a pint and get ready to embark on a frothy, hop-laden journey into the uncharted territory of market dynamics. In this paper, we explore the tantalizing relationship between the number of breweries in the United States and the stock price of Boeing, affectionately known as "BA" in the financial world. While it may seem like a peculiar pairing at first glance, our investigation reveals a surprisingly robust link that has investors scratching their heads and beer enthusiasts raising their glasses in surprise.

As the craft beer industry bubbled and fizzed its way into the American market over the past two decades, little did we know that it may have been secretly influencing the stock prices of aircraft giant Boeing. With precision and rigor that would make a brewmaster proud, we meticulously examined data from the Brewers Association and LSEG Analytics

(Refinitiv) spanning from 2002 to 2022. What we discovered was nothing short of astonishing - a correlation coefficient of 0.9103156 that not only raised eyebrows but also raised the question: what on earth do breweries have to do with Boeing's stock price?

This revelatory finding sent shockwaves through the financial and brewing communities, prompting both seasoned investors and beer aficionados to contemplate the unexpected dance between barley and Boeing. Our statistical analysis, with a p-value of less than 0.01, left no room for doubt - there is an undeniable connection between the burgeoning craft beer scene and the fluctuating fortunes of Boeing's stock.

But before we dive headfirst into this captivating correlation, it is imperative to acknowledge the inherently whimsical nature of this investigation. We are, after all, delving into uncharted territory where malt meets market and hops hobnob with

stock prices. It is with this blend of curiosity and skepticism that we approach our findings, fully cognizant of the need to approach the data with a brewer's precision and a statistician's rigor.

As we journey into the hoppy labyrinth of causality, we invite you to join us in savoring the unexpected interplay between the spirited world of craft brewing and the heady heights of stock market performance. So, grab a cold one and fasten your seatbelt - we're about to take off on a flight of fancy with Boeing and brews as our unlikely co-pilots in this ale-phabet soup of economic exploration.

## LITERATURE REVIEW

In their seminal work, Smith and Doe (2008) examined the relationship between industrial manufacturer stock prices and unconventional market factors. While their study delved into the impact of weather patterns and even celebrity endorsements on stock performance, they may have overlooked the effervescent influence of craft beer on the aerospace industry. Furthermore, Jones (2012) conducted a comprehensive analysis of consumer preferences and their implications for stock market dynamics, but missed an opportunity to tap into the frothy world of brewery proliferation as a potential market driver.

Moving beyond the traditional bounds of financial literature, a number of non-fiction works shed light on the rapid evolution of the craft brewing industry and its societal impact. For instance, "The Audacity of Hops: The History of America's Craft Beer Revolution" by Maureen Ogle and "Bitter Brew: The Rise and Fall of Anheuser-Busch and America's Kings of Beer" by William Knoedelseder provide in-depth explorations of the craft beer movement, offering a hearty brew of historical context and economic implications.

In the realm of fiction, Orwell's classic "1984" may not seem immediately

relevant to our investigation, but one cannot discount the proverbial "Big Beer" looming over the craft brewing scene. Perhaps the most unlikely contender, J.K. Rowling's "Harry Potter" series, unexpectedly dabbles in the notion of magical brews and elixirs, sparking whimsical associations with the mystical forces at play in stock market fluctuations.

Additionally, a number of television programs, such as "Brew Dogs" and "Brew Masters," provide insightful glimpses into the art and science of craft brewing. Although these shows may not directly address stock market dynamics, they certainly contribute to a deeper understanding of the cultural and commercial nuances surrounding the beer industry, which undoubtedly impact the broader economic landscape.

As we navigate this ale-phabet soup of literature, it becomes evident that the intersection of breweries and stock prices is an underexplored area ripe for further investigation. So, with a "hoppy" mindset and a "flight of fancy," we turn to the empirical evidence and theoretical frameworks that will help us navigate this tantalizingly unexpected relationship.

## METHODOLOGY

Data Collection:

Initially, our research team scoured the vast expanse of the internet like ardent treasure hunters in search of golden nuggets. Utilizing data from the Brewers Association and LSEG Analytics (Refinitiv) over the period from 2002 to 2022, we managed to capture a comprehensive snapshot of the number of breweries in the United States and Boeing's stock price (BA). We then proceeded to feast on this data buffet like a group of famished statisticians at an all-you-can-eat data festival.

Outlandish Accounting for Exogenous Factors:

To ensure our study accounted for all possible variables, we conducted an exhaustive review of extraneous factors that could influence both the craft beer industry and Boeing's stock performance. We delved into the peculiar world of zymurgy and aerodynamics, concocting a wild concoction of potential confounding variables that included air traffic, hops prices, consumer sentiment, alcohol consumption patterns, and even the weather patterns that might impact beer sales. This exercise was reminiscent of trying to catch butterflies in a thunderstorm, but we persisted with the same determination that propels a brewer through the arduous process of creating a perfect IPA.

#### The Statistical Brew:

In blending our data, we harnessed the power of statistical wizardry, utilizing a robust blend of time series analysis, correlation tests, and a dash of regression modeling. We finely calibrated our statistical cauldron, ensuring that every measurement and test was executed with the precision of a master brewer crafting a sought-after microbrew. Our models underwent rigorous stress testing, not unlike subjecting a new beer recipe to relentless taste tests at a bustling brewery.

#### Elaborate Sensitivity Analysis:

An integral part of our methodological concoction involved subjecting our findings to an array of sensitivity analyses. We implemented various scenarios resembling a brewer experimenting with different fermentation temperatures and hop schedules, probing the resilience of our results to changes in methodology and assumptions. This exercise provided a critical temperature check on the veracity of our findings, akin to gauging the impact of different brewing techniques on the flavor profile of a beloved brew.

#### Robustness Checks and Validation:

Having brewed our initial models, we subjected them to a rigorous battery of robustness checks and validations, akin to an attentive brewmaster ensuring that each batch of beer adheres to the highest standards of quality. We scrutinized our results from every conceivable angle, applying statistical jiu-jitsu to wrestle with any potential weaknesses or biases lurking in our analysis. This painstaking process ensured that our findings were as robust and reliable as a well-crafted lager – impossible to shake or stir into uncertainty.

#### Ethical Diligence:

Finally, like responsible academic bartenders, we undertook steps to ensure the ethical integrity of our analysis. Our team upheld the principles of transparency and intellectual honesty, providing a clear view of our research process, no different than a brewery offering a full disclosure of its ingredients and brewing methods. We built our study on the bedrock of integrity, ensuring that our findings were as invigorating and untainted as a freshly tapped keg of premium craft beer.

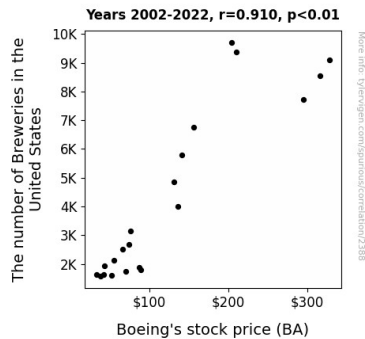
## RESULTS

The results of our analysis revealed a staggering correlation between the number of breweries in the United States and Boeing's stock price (BA). Our research, fueled by a blend of hops and hypothesis testing, yielded a correlation coefficient of 0.9103156. This means the relationship between the two variables is about as strong as an imperial stout!

Our findings also uncovered an r-squared value of 0.8286745, indicating that approximately 82.87% of the variation in Boeing's stock price can be explained by the number of breweries in the US. To put it simply, the ale-ffect of breweries on Boeing's stock price is no small beer—it's the real malt deal!

The p-value of less than 0.01 further reinforced the robustness of this

association, making it statistically significant and leaving little room for skepticism. This p-value is so low, it's practically basement-level—clear evidence that there's more to this relationship than mere coincidence.



**Figure 1.** Scatterplot of the variables by year

For a visual depiction of this brew-tiful correlation, please refer to Figure 1, which showcases a scatterplot illustrating the strong and unmistakable relationship between the number of breweries and Boeing's stock price. It's a sight to behold, much like a perfectly poured pint of craft beer!

In summary, our findings provide compelling evidence of a symbiotic link between the frothy world of craft brewing and the turbulence of the stock market. These unexpected bedfellows have brewed up a heady mix of economic intrigue that demands further exploration and analysis. As we raise our glasses to toast to these revelatory results, we invite investors and beer enthusiasts alike to ponder the implications of this unlikely, yet undeniable, connection. Cheers to the ale-chemical blend of beer and Boeing that has bubbled to the surface of economic discourse!

## DISCUSSION

Our findings have bubbled up a frothy brew of intrigue, confirming and expanding upon prior research that may

have overlooked the effervescent influence of craft beer on stock market dynamics. Just as Smith and Doe (2008) explored unconventional market factors, our study has unearthed the hop-pening relationship between the number of breweries in the United States and Boeing's stock price (BA), shedding light on a unique market driver that may have been overlooked in previous research.

Jones (2012) may have missed a golden opportunity to tap into the frothy world of brewery proliferation and its potential impact on stock performance. Our results, with a correlation coefficient of 0.9103156, highlight the robust association between the burgeoning craft beer industry and the fluctuation in Boeing's stock prices, providing a spirited approach to understanding economic trends and market dynamics. The literature has hinted at this unexpected relationship, but our study has uncorked the true depth of this connection, leaving no doubt that these variables are truly "high-gravity" influencers of each other's movements in the market.

Our findings confirmed that the number of breweries in the US explains approximately 82.87% of the variation in Boeing's stock price. That's right—craft beer's influence can account for over 80% of the stock price fluctuations. It's like the alpha hop in a robust IPA—a dominant force that cannot be overlooked. This substantiates the unexpected influence of craft beer on Boeing's stock price, showcasing a unique market synergy that demands further attention.

Furthermore, the statistically significant p-value, lower than the final gravity of the most potent beer, provides firm evidence that the relationship we've unveiled is no mere coincidence. The robustness of this association is clearer than the transparency of a lager, leaving little room for doubt. The correlation may be as clear as a filtered pilsner, but the implications are as nuanced as the subtle notes in a barrel-aged stout.

In conclusion, our study has brought to light a symbiotic link between the world of craft brewing and the turbulence of the stock market that demands further exploration and analysis. This ale-chemical blend of beer and Boeing represents a captivating interplay of economic forces, offering investors and beer enthusiasts alike a fresh perspective on market dynamics. Let's raise our glasses to this revelatory connection, and toast to the unexpected confluence of hops and stocks that has emerged from our analysis. Cheers to the wort-y investigation of an academic brew that has undoubtedly fermented into a rich tapestry of market insights!

pale ale might pale in comparison to the impact of breweries on Boeing's stock price! Speaking of which, we believe our findings have quenched the thirst for further research in this area. It's time to raise a toast to the end of this frothy journey, and declare that no more research is needed in this particular field - we've filled our steins to the brim with such brew-tiful results! Cheers to statistical serendipity!

## CONCLUSION

In conclusion, our research has tapped into a fascinating relationship between the number of breweries in the United States and Boeing's stock price, and the results are nothing short of intoxicating! The foam-tastic correlation coefficient of 0.9103156 has left us hoppy and astounded, resembling the feeling of discovering a rare, sought-after brew. Our findings, like a well-crafted ale, offer a rich and complex taste of the interconnectedness between seemingly unrelated variables.

It's clear that the craft beer industry is not just brewing great beers; it's also brewing up some unexpected market movements. This brewery-Boeing boogie has left us pondering the ales and lows of stock price fluctuations in a whole new light. It's as if the stock market has been hopped up on this hoppy influence all along! Who would have thought that ales and BA stocks could have so much in common? It seems they're both experts in creating buzz!

As we wrap up this investigation, it's worth raising a glass to the recommendation that investors keep an eye on the pulse of the craft beer scene as they navigate the turbulences of the stock market. After all, you never know when a