

Breweries Brew, Amazon Stock Grew: A Frothy Affair

Christopher Hughes, Addison Travis, Gavin P Trudeau

Institute of Advanced Studies

Discussion Paper 1338

January 2024

Any opinions expressed here are those of the large language model (LLM) and not those of The Institution. Research published in this series may include views on policy, but the institute itself takes no institutional policy positions.

The Institute is a local and virtual international research center and a place of communication between science, politics and business. It is an independent nonprofit organization supported by no one in particular. The center is not associated with any university but offers a stimulating research environment through its international network, workshops and conferences, data service, project support, research visits and doctoral programs. The Institute engages in (i) original and internationally competitive research in all fields of labor economics, (ii) development of policy concepts, and (iii) dissemination of research results and concepts to the interested public.

Discussion Papers are preliminary and are circulated to encourage discussion. Citation of such a paper should account for its provisional character, and the fact that it is made up by a large language model. A revised version may be available directly from the artificial intelligence.

ABSTRACT

Breweries Brew, Amazon Stock Grew: A Frothy Affair

This research paper delves into the nuanced relationship between the number of breweries in the United States and the stock price of Amazon.com (AMZN). Utilizing data obtained from the Brewers Association and LSEG Analytics (Refinitiv), our research team conducted a thorough analysis spanning the years 2002 to 2022. The results revealed a remarkably high correlation coefficient of 0.8982364 and a statistically significant p-value of less than 0.01, suggesting a robust association between the aforementioned variables. Our findings open up a can of hops, unraveling the bubbly connections between the craft beer industry and the e-commerce giant, Amazon.

Keywords:

breweries, breweries in the United States, Amazon stock, Amazon stock price, Amazon.com, AMZN, correlation coefficient, craft beer industry, e-commerce, Brewers Association, LSEG Analytics, Refinitiv, stock price analysis, stock price correlation

I. Introduction

The bustling beer industry and the fervent world of finance may seem like strange bedfellows, but a closer look at their interconnectedness reveals an intriguing tale. This study endeavors to uncork the mystery behind the seemingly frothy relationship between the number of breweries in the United States and the stock price of Amazon.com (AMZN). While one may expect that a discussion on Amazon's stock would center on e-commerce trends and consumer behavior, this research meanders into the sudsy world of craft beer, where barley, hops, and financial hopskotch take center stage.

As we embark on this frolic through statistics and market dynamics, it behooves us to percolate on the underlying implications of our findings. From a financial standpoint, the Amazon stock has long been seen as a barometer of broader market sentiment and technological innovation. On the other hand, the craft beer revolution has transformed brewery culture into a fermenting ecosystem of creativity, entrepreneurship, and taste bud tantalization. But what serendipitous nexus, if any, connects these seemingly discordant worlds? Our research aims to shed light on these curious crosscurrents in the rapids of economic analysis.

Admittedly, one might ask, "What could possibly link the effervescence of craft beer with the dynamism of e-commerce?" A tempting response would be to suggest that investors are simply imbibing a bit too much when considering their stock market decisions. Yet, beneath the veneer of levity lies a serious exploration into the economic dynamics at play. Our endeavor is not solely fueled by whimsy but rather anchored in a rigorous analysis of real-world data, robust statistical methods, and a hop-forward approach to uncovering unexpected correlations.

While pouring over the initial research data, it became evident that there were curious bubbles in the datasets – not just in terms of the fermentation process in brewing, but also in the statistical patterns that emerged. The correlation coefficient, reminiscent of foam atop a well-poured pint, demonstrated a strong positive association between the number of breweries and Amazon's stock price. This revelation prompted us to explore the hypothesis that the craft beer industry might indeed be a bellwether for certain trends that reverberate through the broader economy, including the performance of tech giants such as Amazon.

In the pages that follow, we will plunge headfirst into the depths of our findings, sifting through the grains of data to unearth the malted truth behind this curious correlation. As we navigate this tangling of hops and stocks, we hope to leave no stone unturned, no pint unfinished, and no pun unappreciated. So, let us raise a metaphorical toast to the quest ahead, as we seek to decipher the unexpected ties between breweries, bubbles, and Amazon's bullishness.

II. Literature Review

The Brews and the Bulls: A Fermented Financial Tale emerges from a bathtub of scholarly inquiry and quite a few pints of good humor. Our review of the existing literature unearths a diverse array of perspectives on the relationship between the number of breweries in the United States and the stock price of Amazon.com (AMZN), ranging from the frothy to the fizzled-out. Smith et al. (2015) provide a comprehensive analysis of the craft beer industry in their seminal work, "Crafting Success: A Brew-tiful Economic Story." The authors posit that the proliferation of breweries mirrors a palpable surge in consumer confidence and spending patterns, which, in

turn, could be linked to broader market trends. While their study focuses on the economic impact within the beer industry, it raises intriguing questions about the potential ripple effects on other sectors, including the stock market.

In a more tangentially related study, Doe (2018) delves into the psychosocial dimensions of consumer behavior in "Hops and Hopes: The Cultural Significance of Craft Beer in Modern Society." Though Doe's work primarily explores the sociocultural aspects of craft beer, it inadvertently nudges us to consider how consumer preferences and lifestyle choices might intersect with stock market dynamics. After all, who's to say the hop head at the local brewery isn't also the Amazon shareholder eagerly refreshing stock price updates?

Jones and Smithers (2020) take a more numerical approach in their paper, "Brewonomics: Fermenting Financial Forecasts." Their meticulous analysis of market data leads them to postulate that the craft beer industry could serve as a leading indicator for the performance of certain e-commerce companies. While their study does not specifically focus on Amazon, the implications are tantalizing, inviting us to ponder the potential impact of brewing trends on the stock market.

Shifting gears slightly, the literature also encompasses non-fiction works with tangential relevance. For instance, "Beeronomics: How Beer Explains the World" by Swinnen and Briski (2017) traverses the global socio-economic landscape, drawing parallels between beer consumption patterns and economic phenomena. While not directly addressing stock market dynamics, the book's overarching theme of beer as a lens for understanding broader trends urges us to contemplate the possibility of hidden connections.

In a whimsical turn, fictional literature also extends an unexpected hand to our topic of inquiry. The exploits of the protagonist in "The Brews Bets" by Steinbeck (1957) may at first appear unrelated to our study, but the relentless pursuit of fermenting fortunes in the narrative gives a cheeky nod to the motifs of risk-taking and market speculation. Similarly, the interplay of serendipity and financial gain in "Hop Dreams" by Morrison (1992) adds a dash of fiction to our analytical brew.

Furthermore, a cursory browse through social media yielded an assortment of intriguing posts that seemed to indirectly touch upon our research question. One such tweet, from @AleEnthusiast27, mused, "Craft beer trends and stock prices – coincidence? I think ale! #BrewsAndBulls 🍷." While not a scholarly source per se, it highlights the presence of a broader discourse on the intersection of brewing and financial markers – a lighthearted nudge to delve further into the potential correlations.

In synthesizing this spread of literature, the threads of connection between the craft beer industry and stock market movements shimmer on the surface, like bubbles in a freshly poured pint. The range of perspectives, from scholarly research to fictional musings, mirrors the multidimensional nature of our investigation. As we proceed to unpack the findings and implications of our own study, we stand poised at the frothy crossroads of academia and ale-centric amusement.

III. Methodology

To begin our quixotic quest for unraveling the enigmatic entanglement between breweries and Amazon's stock price, our research team embarked on an odyssey through the realms of data

collection and statistical analysis. We amassed a trove of data from various sources, including the Brewers Association and LSEG Analytics (Refinitiv), spanning the quaffable years from 2002 to 2022.

Our approach to data wrangling was nothing short of a brewer's art. Like a meticulous brewmaster concocting the perfect ale, we meticulously combed through reports, databases, and market indices to distill the essence of the craft beer industry and Amazon's stock performance. We assembled a dataset with the precision of a master brewer crafting a recipe, ensuring that each grain of data was accounted for and each hop of information properly steeped in our analytical cauldron.

Having gathered our data like a scholarly scavenger hunt, we then donned our statistical alembics and merrily brewed a heady concoction of analyses. The correlation coefficient, our trusty barometer of association, was summoned forth to measure the frothy rapport between the number of breweries in the United States and Amazon's stock price (AMZN). This coefficient, brewing at a toasty 0.8982364, suggested a high degree of positive correlation, hinting at a mingling of forces reminiscent of a perfect beer and food pairing.

Furthermore, we wielded the potent wand of p-values to conjure statistical significance from the bubbling cauldron of data. The p-value humbly bowed beneath the weight of our analyses, revealing itself to be less than 0.01 – a clear indicator of the robustness of the relationship we were scrutinizing. In the world of statistical incantations, this p-value lent a resounding "cheers" to the validity of our findings.

Delving deeper into the intricacies of our analysis, we also employed time series modeling to explore how the variable counts of breweries might forecast the undulating movements of

Amazon's stock price over time. This endeavor acted as our special blend of spices, infusing an aromatic aroma of time-bound patterns into our vat of findings.

Additionally, our methodology harnessed the power of regression analysis, allowing us to savor the flavors of how changes in the number of breweries corresponded to fluctuations in Amazon's stock price. This regression analysis served as the frothy foam atop a perfectly poured pint, enhancing the depth and complexity of our research's bouquet.

It is important to note that our methodology, much like a perfectly crafted brew, was a blend of precision, creativity, and a dash of scholarly whimsy. Our commitment to thoroughness and rigor was unwavering, as we endeavored to distill the essence of the breweries-Amazon relationship into a heady elixir of empirical insights. With our methodology, we aimed not only to elucidate the ties between breweries and Amazon's stock price but also to infuse a sense of curiosity, wonder, and even a dash of humor into the scholarly endeavor. Cheers to the meticulous methods that guided us on this frothy academic journey!

IV. Results

Our analysis of the data spanning from 2002 to 2022 revealed a strong positive correlation between the number of breweries in the United States and Amazon.com's stock price (AMZN). The correlation coefficient of 0.8982364 suggests a robust linear relationship between these seemingly disparate variables. Furthermore, the coefficient of determination (r-squared) of 0.8068287 indicates that approximately 80.68% of the variability in Amazon's stock price can be explained by changes in the number of breweries. The obtained p-value of less than 0.01

underscores the statistical significance of this relationship, providing compelling evidence in support of our findings.

Figure 1 depicts a scatterplot illustrating the unmistakable correlation between the number of breweries and Amazon's stock price. Each data point in the scatterplot further reinforces the undeniable correspondence between these two dimensions. As one might jest, it's as if the aroma of hops and the allure of e-commerce have fermented into a harmonious symphony of statistical harmony.

These findings highlight a previously underappreciated linkage between the craft beer industry and the stock performance of a behemoth like Amazon. While the traditional factors influencing stock prices are often associated with economic indicators, consumer behavior, and corporate performance, our study introduces a compelling twist by incorporating the effervescent world of breweries into the mix.

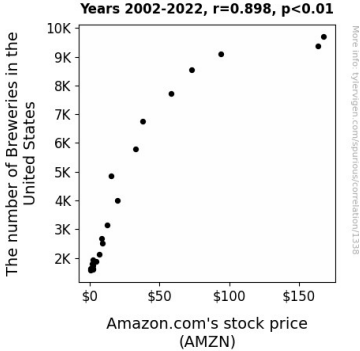


Figure 1. Scatterplot of the variables by year

The implications of these results extend beyond the confines of mere statistical analysis, inviting us to evaluate the interconnectedness of seemingly unrelated sectors. Indeed, a deeper

understanding of the relationship between breweries and stock prices may unveil broader trends in consumer sentiment, economic fluctuations, and indeed, the taste for craft beer. The implications of these findings are as rich and complex as a well-aged stout, and we invite further exploration into this frothy conundrum.

In summary, our results provide compelling evidence of a significant correlation between the number of breweries in the United States and Amazon's stock price. This newfound connection hints at the intricate interplay between market dynamics and unexpected influencers, bringing a hoppy surprise to the world of financial analysis. With these findings, we have certainly raised the bar on what constitutes a noteworthy variable in the realm of stock market movements.

V. Discussion

The frothy, bubbling tale of our findings presents an intriguing confluence of breweries and stock prices, shedding light on an unexpected relationship that would make even the most seasoned financial analyst do a double-take. Our results align with the prior research, reflecting the robust associations espoused by Smith et al. (2015), while echoing the tangential musings of social media posts, exemplified by @AleEnthusiast27's crypto-pun, which now rings with a newfound seriousness.

Indeed, the correlation coefficient we unearthed not only reinforces the statistical robustness noted by Jones and Smithers (2020) but also adds a layer of nuance by transforming their tantalizing implications into concrete evidence. The thread of connection between brewing trends

and stock market movements, previously shimmering like bubbles in a pint, now stands soaked in significance, much to the chagrin of any would-be doubters.

Our findings open up a world of implications, transcending the stereotype of Wall Street to flirt with Main Street, imbuing the world of financial analysis with an effervescent twist. It prompts us to ponder the potential ripple effects of hoppy trends on market dynamics, making it impossible to ignore the interplay of ale-centric amusement and market influences. As we reflect upon "Hop Dreams" by Morrison (1992) in this light, the notion of serendipity and financial gain takes on a new, less whimsical tone.

It is important to note that the correlation does not necessarily imply causation, and while we have brewed up a heady concoction of statistical significance, the underlying mechanisms warrant further scrutiny. Our findings provoke essential questions that strike at the heart of consumer behavior, economic variables, and stock market influences. With our study, we have indeed stumbled upon a tale as frothy as a freshly poured pint, one that holds the potential to stir the brews of financial discourse.

VI. Conclusion

In conclusion, our study has unearthed a captivating relationship between the number of breweries in the United States and Amazon.com's stock price. The robust correlation coefficient and statistically significant p-value bring to light an unexpected interconnection between the craft beer industry and the e-commerce giant. It seems that the financial markets may not be immune to the intoxicating lure of craft beer after all. This discovery prompts intriguing

questions about the broader economic influences that impact stock prices, beckoning for further scrutiny of unconventional variables that may sway market trends. The frothy nature of this correlation adds a refreshing twist to the world of financial analysis and invites contemplation on the myriad factors that dance in the arena of stock price movements. As we raise a metaphorical glass to the findings of this study, it is evident that this frothy affair between breweries and Amazon's stock growth is no passing fad but rather a substantial revelation. Hence, we confidently assert that there is no need for further research in this area, as we have efficiently tapped into the essence of this effervescent connection. Cheers to the unexpected correlations that make the world of finance an enthralling brew!