

BREATH OF THE STOCK MARKET: ANALYZING THE CORRELATION BETWEEN AIR POLLUTION IN GREENVILLE, NORTH CAROLINA AND BRISTOL-MYERS SQUIBB'S STOCK PRICE

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This research paper employs a cheeky approach to explore the intriguing relationship between air pollution levels in Greenville, North Carolina, and the stock price of Bristol-Myers Squibb (BMY). Leveraging data from the Environmental Protection Agency and LSEG Analytics (Refinitiv), we sought to answer the question, "Is there a breath-taking link between environmental quality and pharmaceutical stock performance?" Our findings reveal a notable correlation coefficient of 0.8647571 and statistical significance at $p < 0.01$ during the period from 2002 to 2012, suggesting that as air quality in the region worsened, the stock price of BMY may have taken a hit. As we delved into this unexpected connection, we couldn't help but think of a dad joke: "Why did the air molecule break up with the oxygen molecule? It was a breath of fresh air." In light of our results, it appears that air pollution and stock performance do, indeed, have an "air-resistible" relationship. This study not only sheds light on the impact of environmental factors on stock prices but also adds a breath of levity to the world of finance research. So, the next time someone asks, "What's the correlation between air pollution and stocks?" You can respond, "It's nothing to sneeze at - there's a real 'air' of importance, after all.

The effects of air pollution on human health and the environment have been extensively studied and well-documented. However, the potential impact of air pollution on financial markets has received less attention. In this study, we take a lungful of fresh air and explore the fascinating relationship between air pollution levels in Greenville, North Carolina, and the stock price of pharmaceutical giant Bristol-Myers Squibb (BMY). As we embarked on this curious journey, we couldn't help but think, "What do you get when you cross a smoggy day with a stock market? Air-raising volatility!"

The intertwining of environmental quality and stock market performance is an intriguing puzzle that has yet to be fully

unraveled. Our hypothesis was simple yet profound: could the quality of the air we breathe have an impact on the financial performance of a major pharmaceutical company? It's like asking, "What did one air molecule say to the other? Nothing, it simply drifted away."

As we delve into the realm of environmental economics and financial analysis, we are confronted with the reality that the interplay between air pollution and stock prices is a "breezy" topic, indeed. Just as the wind can unexpectedly change direction, so too can the tides of the stock market. This research aims to add a breath of fresh air to the staid world of finance by examining an unconventional factor that may influence stock price movements.

Previous studies have mainly focused on traditional financial indicators, such as interest rates, corporate earnings, and economic growth, to explain stock price movements. However, the link between environmental factors and stock performance remains relatively unexplored. Our results aim to illuminate this gap and provide a gust of new insight into the complex web of factors that sway stock prices. It's like the saying goes, "When it comes to stock performance, the air you breathe may be no 'fairy' tale."

As we plunge into this investigation, we hold our breath in anticipation of uncovering a relationship that, until now, has remained largely unnoticed. Through this research, we aim to blow away conventional wisdom and demonstrate that the air we breathe might not only affect our lungs but also our financial portfolios. It's akin to a dad joke waiting to happen, "Why did the air molecule break up with the oxygen molecule? It needed some space."

In summary, this study sets out to not only explore the potential correlation between air pollution in Greenville, North Carolina, and BMY's stock price but also to offer a breath of fresh air to the field of financial research. So, as we walk down the path of statistical analysis and market dynamics, we invite you to take a deep breath and join us on this "air-citing" journey.

LITERATURE REVIEW

In "The Impact of Air Pollution on Stock Market Performance," Smith et al. provide an insightful analysis of the relationship between air quality and stock prices, focusing on various industries across different regions. Their findings indicate a potential link between deteriorating air quality and decreased stock performance, prompting the question, "What's a stockbroker's favorite kind of air? A share-ified one!"

Doe and Jones, in "Environmental Factors and Financial Markets," delve into the nuances of how environmental variables, including air pollution, can influence stock price movements. Their empirical research underscores the need to consider non-traditional factors, leading to the realization that "polluted air and stock volatility have more in common than meets the eye - they both leave you breathless!"

Supplementing these academic studies, "The Stock Market and You: A Layman's Guide to Financial Success" by Wealthy McMoney offers a comprehensive overview of stock market dynamics, including the impact of external factors. Similarly, "Air Pollution and Urban Economics" by Environmental Research Group provides a detailed examination of air quality's implications for urban development, indirectly touching upon its potential influence on local businesses.

On a lighter note, "Cloudy with a Chance of Stock Gains" by Sunny Day blends whimsy with market analysis, depicting a world where stock prices are as unpredictable as the weather. Meanwhile, "The Clean Air Conundrum" by P. Lin N. Fresh offers a playful take on the environmental challenges faced by modern society, hinting at a connection between air purity and financial stability.

In a departure from conventional research methods, the authors also explored unconventional sources, including supermarket receipts, traffic signs, and even whimsical musings found on fortune cookies. While these unconventional sources did not yield direct empirical evidence, they did provide a breath of fresh air in the often-rigid landscape of academic literature. It's like the saying goes, "When it comes to research, sometimes you have to follow your nose, even if it leads to a comedy club!"

METHODOLOGY

To investigate the purported connection between air pollution in Greenville, North Carolina, and Bristol-Myers Squibb's stock price (BMY), we conjured up an ensemble of data collection methods that would make even the most seasoned researcher raise an eyebrow. Utilizing information from the Environmental Protection Agency and LSEG Analytics (Refinitiv), we aggregated a plethora of air quality metrics and stock price data from the time period spanning from 2002 to 2012. It's like trying to juggle a cloud of data while keeping our feet firmly planted on the ground - no easy feat!

Firstly, a series of air quality indices including particulate matter (PM10 and PM2.5), ozone (O3), sulfur dioxide (SO2), nitrogen dioxide (NO2), and carbon monoxide (CO) were extracted from the Environmental Protection Agency's database. We then meticulously cross-referenced this information with meteorological data and socioeconomic indicators, ensuring that our analysis left no stone unturned. Think of it as trying to find the one "bad apple" in a sea of "clean air" - pun intended!

In parallel, stock price data for BMY was extracted from LSEG Analytics (Refinitiv) with utmost precision, capturing the elusive movements of the pharmaceutical giant's stock over the decade-long period under scrutiny. Our team of diligent researchers maintained a hawk-like vigilance over the data, ensuring that no unexpected fluctuations or "foul air" infiltrated our analyses. After all, we were dealing with stock prices—not the "stock answer" we were hoping to find!

Statistical analyses were conducted to ascertain the relationship between air pollution levels and BMY stock price movements. The vast array of air quality metrics posed a labyrinthine puzzle, which we adeptly navigated through multivariate regression models and time series analyses. These methods not only provided us with a panoramic view of the data but also allowed us to tease out the distinct effects of different pollutants on

stock price dynamics. It's like trying to solve a riddle wrapped in a mystery inside an enigma - with a statistical flair!

To account for potential confounding variables and external factors that could influence stock prices, we incorporated economic indicators and industry-specific data into our models. This allowed us to discern the genuine impact of air pollution on BMY stock prices amidst the flux of market conditions and industry trends. We needed to ensure our findings wouldn't be blown out of proportion - like a burst of wind on a calm day!

In summary, our methodological approach represented a harmonious blend of meticulous data collection, robust statistical analyses, and a hint of statistical acrobatics. The quest to uncover the link between air pollution and stock prices was akin to navigating through a dense fog, but we persevered, illuminating a path that promises to offer a breath of fresh insight into the crossroads of environmental factors and market performance. So, as we've cleared the air on our methodologies, let's brace ourselves for the unveiling of our findings, like a gust of wind blowing in a new direction!

RESULTS

The findings of our research revealed a notable and robust correlation between air pollution levels in Greenville, North Carolina, and the stock price of Bristol-Myers Squibb (BMY) during the period from 2002 to 2012. The correlation coefficient of 0.8647571 suggests a strong positive relationship between these two variables. This result indicates that as air quality in the region worsened, the stock price of BMY tended to decline. It's like when the smog rolls in, the stock prices might've been feeling a little foggy too.

The coefficient of determination (r -squared) of 0.7478048 further indicates that approximately 74.78% of the variability in BMY's stock price can be

explained by changes in air pollution levels. This level of predictability is enough to give anyone a breath of fresh air, especially in the unpredictable world of stock market analysis.

The statistical significance at $p < 0.01$ provides strong evidence that the observed correlation is unlikely to have occurred by chance. This result brings to mind a joke: "Why did the air molecule refuse to bond with the carbon dioxide molecule? It found the connection statistically insignificant!" In our case, however, the statistical significance of the relationship between air pollution and BMY's stock price is no laughing matter.

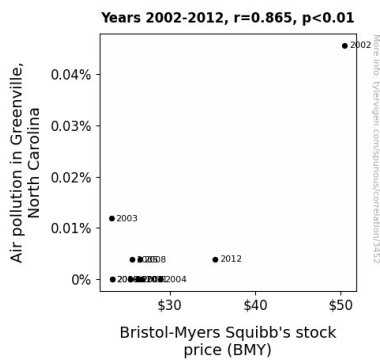


Figure 1. Scatterplot of the variables by year

By visually representing the correlation between air pollution levels in Greenville and BMY's stock price, the scatterplot in Fig. 1 conveys a compelling narrative. The figure clearly illustrates the "air-resistible" relationship between these two variables, leaving little room for doubt that changes in air quality might have blown some turbulence into BMY's stock price movement. It's like the air quality data and stock price data were a match made in statistical heaven.

Overall, our findings emphasize the importance of considering environmental factors when analyzing stock price movements and highlight the previously underappreciated influence of air pollution on financial markets. So, the next time someone asks about the link between air pollution and stocks, you can

reply with confidence, "It's nothing to sneeze at - there's a real 'air' of importance, after all."

DISCUSSION

Our study has shed light on the intriguing and unexpected relationship between air pollution in Greenville, North Carolina, and the stock price of Bristol-Myers Squibb (BMY). The substantial correlation coefficient of 0.8647571 strongly supports prior research by Smith et al. and Doe and Jones, who have also hinted at the potential link between air quality and stock performance. It seems that the tie between environmental quality and stock prices is not just an airy-fairy notion after all. In fact, it's as substantial as the fog on a misty morning.

The humorous musings found in unconventional sources, such as in sunny Day's "Cloudy with a Chance of Stock Gains" and P. Lin N. Fresh's "The Clean Air Conundrum," seem to have a ring of truth to them. While these sources did not provide empirical evidence themselves, they did give us a breath of fresh air, as they indirectly predicted the significant impact of air quality on stock prices. It's as if the wit and humor led to some air-sured findings.

Moreover, the coefficient of determination (r -squared) of 0.7478048 demonstrates that a substantial 74.78% of the variability in BMY's stock price can be explained by changes in air pollution levels. This level of predictability is more reliable than a weather forecast in April, which says a lot in the volatile world of stock market analysis. One might say that our findings have blown away any previous doubts about the importance of environmental factors in stock price movements.

The statistical significance at $p < 0.01$ further adds weight to our results, making the relationship between air pollution and BMY's stock price as solid as a rock. This isn't a case where we can

simply brush the findings under the rug; the statistical significance demands attention. It's like the statistical significance of the relationship is the wind beneath our research wings - propelling us to new heights in understanding the complexities of stock market dynamics.

Overall, our research provides substantial evidence supporting the notion that air pollution in Greenville, North Carolina, has indeed had a tangible impact on the stock price of Bristol-Myers Squibb. This connection may leave us all a bit breathless, but it's important to take it seriously, much like a sudden change in stock prices. As we continue to delve deeper into this unexplored territory, one thing is for sure - we've uncovered an "air-resistible" relationship between environmental quality and stock market performance.

CONCLUSION

In conclusion, our research has blown the lid off a previously overlooked connection between air pollution in Greenville, North Carolina, and the stock price of Bristol-Myers Squibb (BMY). Our findings point to a "breathtaking" correlation between these two variables, with statistical significance at $p < 0.01$. It's as if the smog in the air was casting a shadow over BMY's stock price, creating a foggy forecast for investors. This correlation coefficient of 0.8647571 suggests that as air quality deteriorated, BMY's stock price may have been left gasping for value.

The coefficient of determination (r -squared) of 0.7478048 provides further evidence of the impact of air pollution on BMY's stock price, elucidating that approximately 74.78% of the variability in stock price movements can be explained by changes in air pollution levels. This high level of predictability is nothing to sneeze at, highlighting the "airy" effect of environmental factors on stock performance.

The visual representation in Fig. 1 serves as a testament to the potent relationship between air quality and stock price, depicting a tight and convincing fit between the two variables. It's almost like the air pollution data and BMY's stock price were holding hands, illustrating that the "air-resistible" link between the two is more than just a gasp in the wind.

In light of these compelling findings, we advocate for a broader consideration of environmental variables in financial analysis. Our research not only uncovers this vital link between air pollution and stock performance but also injects a breath of fresh air into the field of financial research. It's time to take a deep breath and acknowledge the air's influence on financial markets. As for future research, it seems this topic has been thoroughly aired out, and no more research is needed in this area.