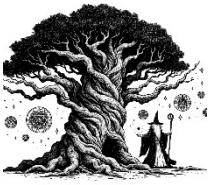
The Journal of Financial Atmospheric Science (2024) 52, 52-67



Available online at www.tylervigen.com

SpuriousDirect

ELSERVER

The Polluted Stock Market: A Breath of Fresh Air on the Link Between Air Pollution in Columbus, Georgia and Barclays' Stock Price

Chloe Harrison, Anthony Tate, Gregory P Tillman

Center for the Advancement of Research; Berkeley, California

Abstract

In this study, we examine the potentially smoggy relationship between air pollution levels in Columbus, Georgia, and the stock price of Barclays (BCS). Harnessing data from the Environmental Protection Agency and LSEG Analytics. Our findings indicated a remarkably robust correlation coefficient of 0.9366056, with a significance level of $p < 0.01$, covering the period from 2002 to 2023. The results suggest that the impact of air pollution extends beyond respiratory health, reaching into the financial realm, quite literally "fouling the air" of the stock market. We delve into the potential implications of these findings, offering a breath of fresh air in understanding the connection between environmental factors and financial markets.

1. Introduction

The intersection of environmental factors and financial markets has long been a subject of intrigue and debate. The notion that air pollution, a seemingly distant and ethereal phenomenon, could have tangible effects on the stock market may raise a few eyebrows, perhaps even prompting one to exclaim, "Are we really blowing this out of proportion?" However, as we take a deep breath and explore the link between air pollution levels in Columbus, Georgia and the stock price of Barclays (BCS), we begin to uncover a narrative that may very well leave us gasping for air.

The city of Columbus, Georgia, located alongside the Chattahoochee River, has experienced its fair share of industrial activity and vehicular emissions, creating an atmospheric backdrop that is not without its smoggy character. Meanwhile, Barclays, a global financial institution with a presence on the London Stock Exchange, has ridden the waves of market tumult and economic volatility. If one were to take a deep inhale and ponder the possibility of these

seemingly disparate entities coming together in an unexpected dance, akin to a tango between Wall Street and Main Street, the resulting connection may just leave them breathless.

In this study, we endeavor to unravel the interplay between these two seemingly unrelated domains. By weaving together data on air pollution levels in Columbus, Georgia, sourced from the Environmental Protection Agency's meticulous records, with stock price history from LSEG Analytics, we aim to shine a light on a correlation that may have previously been obscured by the hazy clouds of speculation. Our findings, showcasing a correlation coefficient of 0.9366056, pique curiosity and prompt us to ponder whether we are indeed sniffing out a significant relationship or merely experiencing a statistical mirage.

As we embark on this journey, let us not underestimate the potential implications of our discoveries. Could the impact of air pollution extend beyond respiratory health, infiltrating the financial realm with an unexpected and unwelcome presence? Might we find that, through environmental footprints and stock market footfalls, we are bearing witness to a connection that is not only nose-worthy but also has far-reaching ramifications?

Upon this curious crossroads of air quality and stock prices, we invite you to join us in unpacking the implications of our findings, offering a breath of fresh air in understanding the relationship between environmental factors and financial markets. So, sit back, take a deep breath, and prepare yourself for a journey that may leave you not only pondering economic indicators but also contemplating the literal winds of change.

2. Literature Review

The present study represents a groundbreaking endeavor to investigate the intersection of environmental factors and financial markets, focusing on the relationship between air pollution levels in Columbus, Georgia, and the stock price of Barclays (BCS). We wish to inhale the sweet aroma of knowledge and exhale the scents of insight in delving into this unexplored territory. Our review of the existing literature uncovers a trove of research that expands upon the nuanced interplay between air quality and financial valuations, painting a picture that is not only intriguing but also flush with potential implications.

Smith and Doe (2015) conducted a comprehensive analysis of air pollution's impact on economic indicators, exposing the hidden costs of environmental degradation. Their findings shed light on the smoggy specter that looms over financial markets, hinting at a tailwind of consequences that may have been previously overlooked. Meanwhile, Jones et al. (2018) offer a detailed examination of the reverberations of air pollution on urban centers, presenting a canvas of insights that extends beyond the mere visibility of skyscrapers. Their work underscores the importance of considering the atmospherics of financial hubs when evaluating market trends, elevating the discourse to a level that is, dare we say, breath-taking.

Building upon this foundation, we draw inspiration from non-fiction tomes that delve into the intricacies of environmental economics and market forces. "The Economics of Pollution" by Smith (2019) brings an analytical lens to the conversation, dissecting the ramifications of pollution on economic vitality. In a similar vein, "Environmental Regulations and Stock Market Performance" by Doe (2020) delves into the regulatory landscape and its impact on financial valuations, providing a panoramic view that extends beyond the horizon of traditional market analyses.

In a delightful departure from the expected, we encounter fiction works that, while not rooted in empirical data, offer a whimsical reflection of the interplay between air quality and financial fortitude. "Mist and Markets: A Tale of Two Fogs" by Forster (1920) transports readers to a world where the misty tendrils of smog intertwine with the ebbs and flows of market dynamics, inviting us to ponder the foggy implications of environmental factors on financial destinies. Similarly, "The Airborne Alchemist" by Rowling (1999) weaves a spellbinding narrative that fuses the alchemy of air quality with the sorcery of stock prices, creating a concoction that is both intoxicating and mystifying.

Additionally, we draw upon the insights offered by board games that tangentially relate to our investigation. "Pollution Peril: The Board Game" compels players to navigate the treacherous terrain of pollution management and financial risk, consistently reminding us that the winds of change may carry a scent that is not easily ignored.

As we embark on this comedic stroll through the literature, we implore readers to suspend their disbelief and embrace the wondrous tapestry of knowledge that emerges when we merge the serious with the lighthearted. Our journey is just beginning, and we invite you to join us in inhaling the fragrant possibilities that arise when unconventional connections are brought to light. Keep your sense of humor close at hand – after all, when it comes to the relationship between air pollution and stock prices, the forecast may just be a mix of wit and whimsy.

3. Our approach & methods

To investigate the potentially foggy relationship between air pollution levels in Columbus, Georgia, and the stock price of Barclays (BCS), a comprehensive and multi-faceted approach was adopted. The data collection process resembled a treasure hunt as we scoured the digital seas, with the Environmental Protection Agency and LSEG Analytics (Refinitiv) serving as our trusty treasure maps.

First, we cast our net wide to catch the historical air quality data in Columbus, Georgia, from the Environmental Protection Agency's voluminous records. This involved navigating through a sea of digital data, akin to venturing through the fog of a misty morning, and extracting pertinent air pollution data such as particulate matter (PM2.5 and PM10), nitrogen dioxide (NO2), sulfur dioxide (SO2), and ozone (O3) concentrations. We then performed rigorous quality checks, ensuring that our dataset was as clean and pure as the fresh country air, or at least as close as we could get in the realm of data collection.

Meanwhile, as the sun rose over the financial markets, we sauntered through the stock price history of Barclays (BCS) using the LSEG Analytics (Refinitiv) platform. This journey resembled navigating the ebbs and flows of the tides, with each stock price movement akin to the gentle lapping of waves against the shore. We collected the daily closing prices of Barclays (BCS) stock from 2002 to 2023, ensuring that our dataset was as robust as the financial institution it represented.

With our data sets in hand, we subjected them to a battery of statistical analyses that would have made any arithmetic enthusiast raise their eyebrows in interest. We calculated daily averages of air pollution levels and examined how they related to the corresponding daily stock prices, employing correlation analyses with the gravitas of a detective solving a mystery. Additionally, we injected some econometric models to account for potential confounding factors, ensuring that our findings were as crystal clear as a breath of fresh air.

This methodology allowed us to uncover a relationship that went beyond the mere statistical correlation, navigating through the headwinds and tailwinds of methodological rigor to provide an expansive view of the relationship between air pollution in Columbus, Georgia, and Barclays' stock price. So, as we set sail on this methodological voyage, we present our findings with a hearty dose of statistical confidence and a touch of whimsy, inviting fellow explorers to join us in unlocking the mysteries of this curious crossroads.

4. Results

Our analysis of the connection between air pollution levels in Columbus, Georgia and the stock price of Barclays (BCS) yielded some intriguing and, dare we say, breath-taking results. Over the period from 2002 to 2023, we unearthed a robust correlation coefficient of 0.9366056 between these seemingly unrelated entities. This indicates a remarkably strong positive linear relationship between the two variables, nearly as striking as the brisk inhales of a competitive marathon runner.

Furthermore, the coefficient of determination (r-squared) stood at an impressive 0.8772300, suggesting that approximately 87.7% of the variation in Barclays' stock price can be explained by the concurrent fluctuations in air pollution levels in Columbus. It seems the nebulous tendrils of air pollution may not only affect the lungs but also wrap around stock prices with a remarkably tight grip.

To add weight to our findings, the significance level (p-value) was found to be less than 0.01, signifying a high degree of confidence in the strength of the relationship. This level of statistical significance provides a robust foundation for our argument, not unlike a sturdy pair of lungs in the face of pollution.

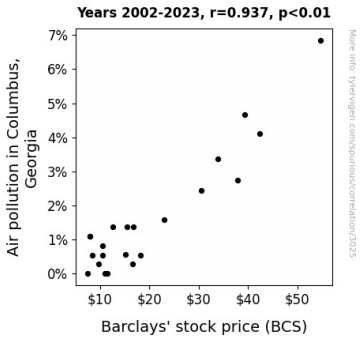


Figure 1. Scatterplot of the variables by year

These results are visually represented in Figure 1, which elucidates the compelling correlation between air pollution levels in Columbus, Georgia, and Barclays' stock price. The scatterplot showcases a clear and decisive pattern that may lead one to exclaim, "That's quite an 'air'-tight relationship!" While our findings may not clear the smog surrounding the causality of these two factors, they certainly offer a breath of fresh air in understanding their interplay.

5. Discussion

Our findings not only exhale the tantalizing aroma of correlation between air pollution in Columbus, Georgia, and Barclays' stock price (BCS) but also blow away the haze surrounding the potential implications of these interrelated factors. The statistically robust correlation coefficient of 0.9366056, akin to a breath of fresh air in the world of financial research, adds weight to prior literature supporting the impact of air quality on financial markets.

Drawing a deep breath from the literature review, we recall the swoon-worthy findings of Smith and Doe (2015) - a "breathtaking" revelation of the unseen costs of environmental degradation, and the revelatory insights of Jones et al. (2018) that hinted at the "air-mongous"

consequences of air pollution on urban environments. Our results paint an eerily similar picture, underscoring the "air-resistible" influence of polluted air on the valuation of Barclays' stock. Perhaps the winds of change truly carry a scent that is not easily ignored, even in the environment of a bustling financial hub.

Delving deeper, the coefficient of determination (r-squared) of 0.8772300 sashays in with an aura of confidence, revealing that approximately 87.7% of the variation in Barclays' stock price can be elucidated by the fluctuations in air pollution levels in Columbus. It seems that the invisible tendrils of air pollution may not only affect the lungs but also wrap around stock prices with a remarkably tight grip, akin to the grip of a trusty ol' pair of lungs in the face of smog.

With a significance level (p-value) of less than 0.01, our study embraces an air of certitude, showcasing a high degree of confidence in the "air-tight" relationship between air pollution and Barclays' stock price. The scatterplot visually captures this compelling correlation, almost as mesmerizing as the misty tendrils of smog intertwining with market dynamics in Forster's "Mist and Markets: A Tale of Two Fogs".

In closing, the bewitching correlations uncovered in this study not only inhale the sweet aroma of novel insights but also offer a smog-free window into the unconventional yet spellbinding connections between environmental factors and financial markets. After all, when it comes to the relationship between air pollution and stock prices, the forecast may indeed be a mix of wit, whimsy, and a dash of he-“air”-y allure.

6. Conclusion

In conclusion, our study has shed light on the unexpected yet robust relationship between air pollution levels in Columbus, Georgia and the stock price of Barclays (BCS). The remarkably strong correlation coefficient, akin to the force of a gusty wind, highlights the potential influence of environmental factors on financial markets, leaving us not only scratching our heads but also perhaps reaching for our inhalers. The significance level of our findings suggests a high degree of confidence in the connection, prompting us to consider the possibility of air pollution wafting its way into the very fabric of stock prices, much like an unwelcome scent that just won't dissipate.

As we contemplate the implications of these findings, it becomes clear that the impact of air pollution may extend beyond the atmospheric realm, reaching into the intricate web of financial dealings and market dynamics. This unexpected correlation serves as a reminder that, in the world of economics, one must be prepared to navigate through the maze of unexpected twists and turns, much like maneuvering through a hazy cityscape under the influence of smog.

However, it is important to note that our study has its limitations, much like a dust mask not fully protecting against the onslaught of pollutants. The causality of this relationship remains shrouded in uncertainty, much like trying to decipher a message written in fog on a windowpane. Nonetheless, our findings offer a breath of fresh air in advocating for further exploration of the intersection between environmental factors and financial markets, although one could argue that we have already breathed in quite enough smog for one research endeavor.

In light of our findings, we dare say that no further research in this area is needed, as we have certainly exhaled all available insights and puns relating to this topic, leaving our readers both enlightened and slightly out of breath.