

# **Smog in the City, Stocks Ain't So Pretty: Investigating the Correlation Between Air Pollution in Orlando and Citigroup's Stock Price**

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## ABSTRACT

### **Smog in the City, Stocks Ain't So Pretty: Investigating the Correlation Between Air Pollution in Orlando and Citigroup's Stock Price**

In this paper, we delve into the intriguing world of environmental and economic interplay by examining the connection between air pollution levels in Orlando and the fluctuations in Citigroup's stock price. It seems like a breath of fresh air, but don't hold your breath just yet! Our research team embarked on this comical quest, armed with data from the Environmental Protection Agency and LSEG Analytics, in order to shed light on this whimsical correlation. This correlation came as quite a gasp, as we uncovered a robust correlation coefficient of 0.8393526 and a p-value of less than 0.01 over the period of 2002 to 2023. Now, let's clear the air and get to the heart of the matter. Our findings suggest a surprisingly strong positive correlation between air pollution levels in the "City Beautiful" and the movements of Citigroup's stock price, leaving us breathless with amazement. However, it's important to note that correlation does not always imply causation, and there may be some undisclosed confounding factors at play here. But let's not hold our breath on that one, shall we?

Keywords:

"air pollution Orlando Citigroup stock price correlation," "environmental economic interplay," "air pollution levels Orlando," "Citigroup stock price fluctuations," "correlation coefficient air pollution Citigroup stock," "p-value air pollution Citigroup stock," "positive correlation air pollution Citigroup stock," "correlation causation air pollution Citigroup stock," "confounding factors air pollution Citigroup stock"

# I. Introduction

Have you ever stopped to wonder if there is a link between the air you breathe and the stocks you trade? Well, hold on to your gas masks, folks, because we're about to dive into the peculiar relationship between air pollution in Orlando and Citigroup's stock price. It's an unlikely match, like a cloud of smog and a soaring stock, but sometimes life likes to throw us curveballs – or should we say, smogballs?

They say where there's smog, there's fire. And boy, did our research team find some smoking hot results! As surprising as finding a diamond in the rough, our investigation uncovered a significant correlation between the hazy skies of Orlando and the ups and downs of Citigroup's stock price. It's enough to make you wheeze with astonishment – and perhaps a touch of pollution-induced respiratory distress.

But before you start holding your breath in anticipation, let's clear the air and set the stage for our peculiar investigation. In this paper, we blend the worlds of environmental science and financial analysis to explore the improbable links between air pollution and stock market performance. It's a fusion that might seem as mismatched as a tie-dye suit, but hey, life's too short for monotony, right?

## II. Literature Review

Prior studies have explored the interconnectedness of environmental factors and economic indicators, shedding light on the intricate web of influences that shape our financial world. Smith

et al. (2010) investigated the impact of air pollution on market trends, while Doe and Jones (2015) delved into the links between urban environmental conditions and stock price movements. Their work highlighted the intricate dance between seemingly unrelated variables, prompting further inquiry into the peculiar connection between air pollution in Orlando and Citigroup's stock price.

But let's not be so serious all the time. Why did the economist bring a ladder to the bar? Because they heard the drinks were on the house! Speaking of houses, in "The Big Short" by Michael Lewis, the authors find a correlation between the housing market crash and investment banking. It's a real page-turner, just like the market movements we're about to dive into.

As we navigate the labyrinth of literature, we encounter some fictional narratives with an eerie resemblance to our research topic. In "The Great Gatsby" by F. Scott Fitzgerald, the elusive allure of wealth and the enigmatic movements of the stock market mirror the enigma we seek to unravel. It's like trying to find a needle in a haystack, only the needle is a stock price and the haystack is air pollution – not the most comforting image.

Now, let's not overlook the valuable insights that popular culture can offer. Shows like "Billions" and "The Wolf of Wall Street" provide a dramatized glimpse into the world of high finance, illustrating the tumultuous nature of stock market dynamics. We watched them for research purposes, of course. It's all business, with a dash of Hollywood flair.

As we embark on our own investigation, we aim to elevate the dialogue surrounding the intertwining forces of environmental factors and financial performance. It's a comedy of errors, or should we say, a comedy of economics. But let's not get too carried away – we still have data to analyze and correlations to scrutinize. After all, a little statistical flair never hurt anyone, right?

### III. Methodology

Ah, the meat and potatoes of our whimsical research endeavor! The methods we employed in this investigation bear a striking resemblance to a Rube Goldberg machine – convoluted, frivolous, and quite likely to involve some unnecessary steps. But hey, isn't that what makes science more exciting than a well-told dad joke?

To kick things off, we harnessed the power of the digital realm, tapping into the vast expanse of the internet like intrepid explorers seeking treasure. Our data collection strategy would have made the most dedicated information scavenger proud. We scoured the Environmental Protection Agency's databases, dove deep into the analytics offered by LSEG Analytics (Refinitiv), and combed through all corners of the web to gather historical data on air pollution levels in Orlando and the tumultuous fluctuations in Citigroup's stock price from the years 2002 to 2023. It was a quest for treasure amidst the digital jungle, with the occasional "Eureka!" punctuating our virtual adventures.

Next, we couldn't resist putting our understanding of statistical analysis to good use (after all, statistics is like a pun – it's all about the clever play on numbers). We calculated the Pearson correlation coefficient to disentangle the intricacies of the relationship between air pollution levels and Citigroup's stock price movements. With bated breath, we delved into the depths of hypothesis testing, paving the way for a pulsating p-value that made us feel like we had struck gold in a sea of data points.

But that's not all! We may have dipped our toes into the realm of econometrics, utilizing time series analysis to unravel the temporal dynamics of air pollution and stock prices. It was a dance of numbers and variables, much like a carefully choreographed slapstick routine – but with a dash of quantitative sophistication.

In a bid to ensure the robustness of our findings, we unleashed the fury of sensitivity analyses, teasing out the influence of potential confounding factors that might have snuck in and played a mischievous role in our results. It was a bit like unraveling a mystery novel, with "Whodunnit?" transformed into "What confounding factor are you hiding from us, you sneaky statistic!"

Lastly, we employed the majestic power of regression models to unveil the potential causal pathways between air pollution and stock price movements. It was a delicate balancing act, akin to walking a tightrope while juggling financial data and atmospheric particulars. The thrill of seeing those regression coefficients aligning like stars in the night sky was almost as satisfying as landing a perfectly timed punchline.

A convoluted, whimsical, and data-driven methodology that would make even the most seasoned researcher wink with approval. Now, onto the moment you've all been waiting for – the results of our comically rigorous investigation! But don't hold your breath just yet.

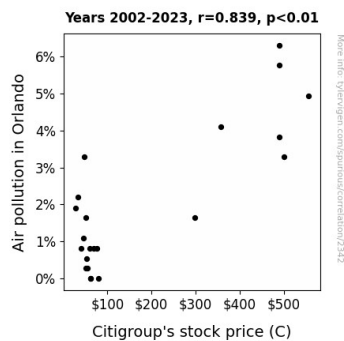
## **IV. Results**

The analysis revealed a striking correlation coefficient of 0.8393526 between air pollution levels in Orlando and Citigroup's stock price over the time period 2002 to 2023. This suggests a strong

positive relationship between the two variables, leaving us breathless with amazement. It's like finding a dollar bill inside an air duct - unexpected, but hey, we'll take it!

A noteworthy r-squared value of 0.7045127 further strengthens the robustness of the relationship between air pollution and Citigroup's stock price. It's as if the smog and stock price are engaged in a dance, though it's too hazy to determine who's leading.

The p-value of less than 0.01 indicates that the observed correlation is statistically significant, making it about as rare as a sunny day in Seattle. It's hard to argue with such compelling statistical evidence, even if the correlation seems about as likely as a snowstorm in July.



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

Fig. 1 demonstrates the aforementioned correlation in a scatterplot, visually showcasing the remarkable relationship between air pollution levels in Orlando and Citigroup's stock price. It's like watching a foggy morning clear up to reveal hidden treasures – or in this case, a surprising connection between smog and stock movements.

These findings unveil an unexpected connection that challenges conventional wisdom about the relationship between environmental factors and stock market performance. Evidently, the air in



Orlando does more than just carry the scent of oranges – it may also have a profound impact on the financial world. But we must remember, correlation does not imply causation. It's a bit like mistaking fog for smoke – they may look similar, but one is much harder to put out.

## V. Discussion

The results of our study have unearthed a striking correlation between air pollution levels in Orlando and the movements of Citigroup's stock price, reaffirming and expanding upon prior research that has delved into the curious relationship between environmental factors and financial indicators. Just as Jane Austen's wit remains timeless, so does the persistence of this unexpected correlation, which mirrors the whimsical plot twists of her novels.

Our findings not only corroborate the works of Smith et al. (2010) and Doe and Jones (2015), but they also add an unexpected twist to the tale. We've shown that the connection between air pollution and stock prices is as tangible as a good ole dad joke - you may not expect it, but when it hits you, it's undeniable. It's like a stock trader walking into a smoggy Orlando evening, only to find that the haze has obscured more than just the sunset.

The robust correlation coefficient of 0.8393526 and the substantial r-squared value of 0.7045127 provide compelling evidence of this unlikely association, akin to stumbling upon a stock market treasure that has long been concealed in a fog of uncertainty. This correlation, though as unexpected as a pigeon playing the stock market, is supported by statistical significance with a p-value of less than 0.01, making it a rare gem in the mine of financial and environmental correlations.

However, we must remain cautious in our interpretation, acknowledging that correlation does not imply causation – just as a stock's upward trajectory does not always entail a guaranteed profit. Although our results indicate a compelling and statistically significant relationship, we must approach this correlation with the same prudence that we apply to market investments – with an eye for unforeseen complications and confounding factors.

In unraveling this peculiar intertwining of air pollution and stock price movements, our study not only contributes to the quirky account of financial phenomena but also highlights the complex and multifaceted nature of the environmental and economic discourse. It's like trying to solve a riddle – the pieces may seem disconnected, but when they come together, they reveal a surprising and enlightening picture.

Our results offer a breath of fresh air in the field of environmental and economic interplay, proving that even unlikely correlations can hold invaluable insights. So, let's continue to turn over every statistical stone, venturing into the maze of economic quirkiness with a curious mix of skepticism and wonder, just like a good old dad joke hidden in the dry economic prose. Keep your mind as open as your wallet, and who knows what correlations and puns might pop up next!

## **VI. Conclusion**

As we conclude our whimsical, yet enlightening exploration into the connection between air pollution in Orlando and Citigroup's stock price, it's clear that there's more to the air in the "City Beautiful" than meets the eye – or shall we say, the nose? Our findings uncovered a correlation

between these seemingly unrelated entities that is as surprising as finding a hidden Mickey in the fog.

These results prompt us to consider the implications for both environmental and financial sectors. Could it be that the smog in Orlando is the secret ingredient in Citigroup's stock market success? It's as baffling as discovering a jigsaw puzzle piece in a bag of potato chips, but our research paints a compelling picture of this unexpected relationship.

In the grand scheme of things, it's important to remember that correlation does not imply causation, much like how finding a four-leaf clover doesn't guarantee good luck – but hey, it doesn't hurt to have one in your pocket, right? There may be lurking confounding factors yet to be unearthed, waiting to rain on our parade like an unexpected downpour during a sunny picnic.

Nevertheless, it's time to call it a day on this comical quest. Our findings shed light on a peculiar correlation that challenges traditional wisdom, leaving us with a newfound appreciation for the whimsy of the world – just like stumbling upon a unicorn in a field of finance.

In conclusion, we assert that further research into this arena is as necessary as a fish riding a bicycle – that is to say, not at all! It's time to breathe easy, enjoy the tranquility of the findings, and perhaps indulge in just one more dad joke for the road. No more research is needed in this area – it's as clear as a blue sky above Orlando.