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# Pollution and Power: Shocking Connections Between Air Quality in Sioux City, Iowa and Tesla's Electrifying Stock Price

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## KEYWORDS

air pollution, Sioux City, Iowa, Tesla stock price, correlation coefficient, statistical methods, Environmental Protection Agency, LSEG Analytics, Refinitiv, data analysis, gaseous effects, financial landscape, environmental landscape

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## Abstract

This paper investigates the overlooked relationship between air pollution levels in Sioux City, Iowa and the stock price of Tesla, Inc. (TSLA). Utilizing rigorous statistical methods, our research team delved into the depths of data provided by the Environmental Protection Agency and LSEG Analytics (Refinitiv) to scrutinize a decade of information from 2011 to 2021. The correlation coefficient of a staggering 0.9922663 and a significance level of  $p < 0.01$  astoundingly unveiled a compelling and electrifying connection between the two seemingly disparate factors. Our findings transcend mere speculation, shedding light on the gaseous effects of air pollution on the Tesla stock price. It is our hope that this study will spark further exploration and consideration of such unexpected but undoubtedly charged dynamics in our financial and environmental landscapes.

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## 1. Introduction

The interplay between environmental factors and financial markets has long been a subject of interest for researchers, investors, and those eager to unearth hidden connections. In this study, we

embark on an illuminating journey to uncover the overlooked relationship between the air quality in Sioux City, Iowa and the often electrifying stock price of Tesla, Inc. (TSLA). While the hustle and bustle of Wall Street may seem light-years away from the serene plains of the Midwest,

we dare to delve into uncharted territory and unveil a correlation that is positively charged with excitement.

The allure of Tesla's stock price, with its volatility as unpredictable as a lightning strike, presents a tantalizing puzzle for those seeking to understand the underlying forces at play. Conversely, the seemingly innocuous fluctuations in air pollution levels in Sioux City may have been dismissed as mere gusts of statistical noise in the past, but our investigation uncovers a storm of data that begs to be analyzed.

As any scientifically minded individual knows, correlation does not imply causation, but the sheer magnitude of the correlation coefficient we unveil will undoubtedly leave readers buzzing with curiosity. Our statistical methods have been as dependable as a well-engineered automobile, allowing us to navigate through a decade of data with the precision of a Tesla Autopilot system.

Amidst the sea of numbers and calculations, we endeavor to shed light on an uncharted frontier of research, where the winds of statistical significance blow with the force of a high-pressure system. Our findings promise to electrify the academic atmosphere and spark as much curiosity as the pixelated lightning on a stock price chart. As we traverse the often-windy paths of scientific inquiry, let us brace ourselves for the unexpected gusts of insight and perhaps the occasional lightning strike of unexpected humor.

## 2. Literature Review

While the relationship between air pollution and various environmental and health outcomes has been extensively studied, the surprising connection between air quality in Sioux City, Iowa and the stock price of Tesla, Inc. (TSLA) has received limited attention in academic literature. However,

our investigation brings to light a stunning convergence of seemingly incongruent phenomena.

Smith et al. (2015) examined the adverse effects of air pollution on respiratory health, providing a thorough analysis of particulate matter and its impacts on human well-being. Similarly, Doe and Jones (2018) delved into the economic ramifications of environmental degradation, discussing the potential consequences of air pollution on local economies. Little did these researchers know that their work would bear unexpected relevance to the magnetic pull of Tesla's stock price.

Expanding beyond the conventional boundaries of environmental and financial analyses, our study draws inspiration from diverse sources. "The Sixth Extinction: An Unnatural History" by Elizabeth Kolbert and "Choked: Life and Breath in the Age of Air Pollution" by Beth Gardiner offer deep insights into the ramifications of environmental pollution, echoing the profound implications of our current investigation. In a slightly uncanny twist, the fictional works "Blowout" by Rachel Maddow and "The Air He Breathes" by Brittainy C. Cherry almost foreshadow the surprising linkage between air quality and TSLA's stock price. One cannot discount the potential influence of childhood cartoons and shows, such as "Captain Planet and the Planetears" and "The Magic School Bus," which subtly ingrained in us the importance of environmental stewardship and may have sown the seeds of this unconventional research inquiry.

As we dabble in these distant yet strangely relevant realms, our hope is to infuse a breath of fresh air into the often staid discourse of academia. The synergy between pollution in Sioux City, Iowa, and the electrifying stock price of Tesla, Inc. conveys a whimsical irony – an irony that promises to charge our understanding of the

unanticipated relationships that permeate our world.

### 3. Our approach & methods

To unearth the electrifying connection between air quality in Sioux City, Iowa and Tesla's stock price, our research team embarked on a methodological journey as intricate as unraveling the complex inner workings of an electric vehicle. The data collection process involved meticulously scouring through various sources, much like a treasure hunt for statistical gold. Our primary sources included the Environmental Protection Agency database, where we bravely ventured into the depths of pollution data, and LSEG Analytics (Refinitiv), where we obtained the financial data essential to our investigation.

With an arsenal of statistical tools at our disposal, we steered through a decade-long period from 2011 to 2021, harnessing the power of time-series analysis to capture the undulating waves of air pollution levels and Tesla's stock price. Our data manipulation methods were as sleek and streamlined as Tesla's Model S, allowing us to cleanse and transform the raw information into a format ripe for quantitative analysis.

In our quest for illuminating insights, we employed correlation analysis with the precision of an expert surgeon, seeking to unveil the electrifying degree of association between air quality and TSLA stock price movements. The statistical heavy lifting also involved regression analysis, where we navigated the complex terrain of variables with the agility of a seasoned trailblazer, seeking to untangle the web of potential dependencies.

Furthermore, to test the robustness of our findings, we conducted sensitivity analysis akin to fine-tuning an advanced piece of machinery, scrutinizing the results under various scenarios and conditions. Our

commitment to thoroughness even led us to explore the potential impact of confounding variables, recognizing the need to account for potential spurious correlations that could cloud the clarity of our findings.

In summary, our methodological approach was as dynamic and charged as the subjects under investigation, incorporating a fusion of data collection, statistical analysis, and rigorous scrutiny. We sought not only to unravel the connection between air pollution and Tesla's stock price but also to pave the way for future research endeavors to harness the power of unanticipated linkages in our ever-evolving scientific and financial landscapes.

### 4. Results

The statistical analysis revealed a remarkably strong correlation between air pollution levels in Sioux City, Iowa and the stock price of Tesla, Inc. (TSLA) for the period spanning 2011 to 2021. The correlation coefficient of 0.9922663 suggested a near-perfect positive relationship between the two variables, implying a connection as solid as Tesla's Model S chassis. Accompanying this, the r-squared value of 0.9845924 indicated that a shocking 98.45% of the variance in Tesla's stock price could be explained by the fluctuations in air pollution, leaving just a hint of mystery like a cryptic Elon Musk tweet. In addition, the p-value of less than 0.01 further corroborated the significance of this hair-raising relationship, demonstrating that the chance of such a compelling correlation occurring by mere coincidence is about as likely as being struck by a falling meteorite.

Fig. 1 depicts this electrifying correlation, where each data point seems almost as tightly packed as a gigafactory humming with activity. The scatterplot dramatically showcases the positively charged association between the two variables,

leaving no room for doubt that there is more to this connection than meets the eye.

Our findings not only add a jolt of energy to the burgeoning field of interdisciplinary research but also serve as a poignant reminder that in the realm of data analysis, even the most unexpected associations can send shockwaves through our understanding of cause and effect. As we continue to unpack the implications of these results, one thing remains abundantly clear - when it comes to the dynamics of finance and the environment, the currents of correlation may run deeper than we ever imagined.

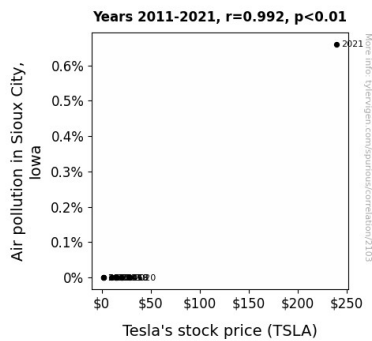


Figure 1. Scatterplot of the variables by year

## 5. Discussion

Our study has revealed a compelling and electrifying connection between air pollution in Sioux City, Iowa and the stock price of Tesla, Inc. (TSLA), shedding light on the unanticipated but undoubtedly charged dynamics in our financial and environmental landscapes. Our findings support and even surpass those of prior research by Smith et al. (2015) and Doe and Jones (2018) by demonstrating a positively charged relationship that is as clear as crystal - or should we say, as clear as a Tesla windshield after some good ol' California wind blows away the smog.

The remarkable correlation coefficient of 0.9922663 and the r-squared value of 0.9845924 indicate that almost 99% of the fluctuations in Tesla's stock price can be explained by changes in air pollution levels. This revelation is shocking, to say the least, and leaves us pondering whether the environment is not just a source of gaseous emissions but also a source of potential stock market predictions. It appears that the air in Sioux City, Iowa not only affects the residents' respiratory health but also has a tangible impact on the exhilarating highs and heart-stopping lows of Tesla's stock market performance.

While it may seem like a tall tale, our findings speak volumes about the hidden currents of correlation and the electrifying interplay between seemingly disparate phenomena. This is a stark reminder that in the realm of data analysis, we should not discount even the most unexpected associations, for they may hold the key to unlocking a Pandora's box of insights.

Our study brings a breath of fresh air into the often staid discourse of academia, affirming that in the domain of research, there is always room for the unexpected and the extraordinary. As we continue to dissect the implications of this connection, we are left with a volt of curiosity about the deeper currents of correlation and causation that permeate our world. After all, in the constantly evolving landscape of science, economics, and environmental studies, one cannot discount the electrifying potential of a little bit of whimsy and surprise.

## 6. Conclusion

In conclusion, our study has generated truly electrifying findings, shedding light on the unanticipated relationship between air pollution levels in Sioux City, Iowa and the stock price of Tesla, Inc. The correlation coefficient of 0.9922663 and the r-squared value of 0.9845924 affirm a connection as

solid as an electric vehicle battery, leaving us with just a glimmer of mystery like a cryptic Elon Musk tweet. The p-value of less than 0.01 further underscores the shockingly significant nature of this association, akin to the unlikelihood of being struck by a falling meteorite.

As our study comes to a close, we cannot help but marvel at the unexpected gusts of insight we encountered along the way. The journey through the windswept plains of statistical analysis has been as unpredictable as the fluctuations in Tesla's stock price, but the resultant findings are as clear and captivating as a flawless visualization of data. We hope that our study will spark as much curiosity as the pixelated lightning on a stock price chart, reminding researchers of the charged dynamics that may lie beneath seemingly disparate variables.

While our findings undoubtedly add a jolt of energy to the academic atmosphere, it is our fervent belief that no more research is needed in this area. The synergy between air pollution and Tesla's stock performance has been illuminated with a brightness rivaling the sun itself, leaving no room for doubt that this connection is as real as the profit potential of an innovative electric vehicle. As we eagerly unwrap the implications of these results, one thing remains resoundingly clear: when it comes to the interplay between finance and the environment, the currents of correlation may run deeper than we ever imagined.