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The Unseen Costs: A Breath of Fresh Air on the Link Between Air Pollution in Grand Junction and POSCO Holdings' Stock Price

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Abstract

In this study, we delve into the entangled relationship between air pollution in Grand Junction, Colorado, and the fluctuations of POSCO Holdings' stock price (PKX). Utilizing data from the Environmental Protection Agency and LSEG analytics (Refinitiv), we embarked on a journey to unravel the mysteries lurking within the interconnected realms of environmental quality and financial markets. Our findings revealed a correlation coefficient of 0.8022025 and a statistically significant p-value of less than 0.01 when analyzing the time period from 2002 to 2023. While the link between air pollution and human health has been extensively studied, our approach scrutinizes the inconspicuous repercussions on the stock market, illuminating the subtle impact of air quality on financial dynamics. The results, though unexpected, shed light on the intricate web of hidden influences shaping market behavior, reminding us that the ecosystem, in its entirety, bears weight on the tumultuous dance of stock prices. As we navigate through these cryptic waters, we urge readers to ponder the poignant question: could the smog's lingering embrace be intertwined with the stock's uncertain fate, or is it the whims of the market that cast a shadow on the city's atmospheric purity? This investigation opens a window into the unexplored territory where finance and environment intersect, challenging conventional wisdom and beckoning us to consider the far-reaching implications of our collective environmental choices.

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1. Introduction

The interconnectedness of seemingly unrelated phenomena has always been a source of fascination in the world of research. From the tiniest microbe to the grandest corporation, the intricate webs of

influence and interdependence can often surprise even the most discerning of observers. In this study, we endeavor to unveil a surprising link between the air pollution levels in Grand Junction, Colorado, and the stock price fluctuations of POSCO Holdings (PKX). While at first glance, one

might dismiss the possibility of any correlation between these two disparate entities, our investigation exposes an unexpected relationship that could have far-reaching implications.

Our foray into this unconventional exploration was not without its challenges, as we navigated through the labyrinthine corridors of environmental data and financial time series. The endeavor was not only an exercise in statistical acrobatics but also a sojourn into uncharted territory where environmental quality and stock market dynamics converge. As we untangled the enigmatic threads of air pollution and stock price movements, we were continually reminded of the subtle interconnectedness that exists within the world of markets and the natural environment.

The research is driven by the belief that every breath of air and every movement of the market holds within it a tale waiting to be unraveled. Our findings, though unexpected, paint a nuanced picture of the invisible forces at play, challenging traditional views and echoing the ancient adage: "the winds of change blow where they will, and sometimes they carry with them unforeseen consequences."

As we plunge deeper into this analysis, it becomes apparent that the stock market, much like the atmosphere we breathe, is not impervious to the subtle nuances of its surroundings. Could it be that the city's atmospheric haze casts a shadow over the stock's fate, or is it the capricious dance of market forces that taints the purity of the air? Our investigation sets the stage for a thought-provoking exploration, invoking deeper introspection into the intricate dance of influence and exchange between the environment and financial realms.

Join us as we peel back the layers of complexity, endeavoring to shed light on the unseen costs that lurk within the tapestry of economic and environmental interactions.

The journey promises to be both enlightening and, dare we say, breathtaking.

2. Literature Review

The intricate relationship between air pollution and financial markets has been a subject of keen interest for researchers over the years. Smith and Doe (2017) conducted a comprehensive analysis of air pollution's impact on various economic indicators, while Jones et al. (2019) delved into the influence of environmental factors on stock price movements. Their findings provided valuable insights into the far-reaching consequences of air pollution on the economic landscape, laying the groundwork for further exploration.

Moving from the solemn realms of academic journals to the wider sea of literature, it's worth noting the diverse array of perspectives on environmental impact and financial dynamics. "The Economics of Clean Air" by Oates and "Environmental Finance" by Scholtens offer a deep dive into the complexities of environmental economics and sustainable finance, providing a solid theoretical foundation for understanding the interplay between air quality and economic activities. On the other end of the spectrum, fictional works such as "Smoke and Mirrors" by Neil Gaiman and "The Polluted Promise" by Agatha Christie offer a more imaginative take on the unseen repercussions of pollution, serving as a delightful departure from the empirical rigor of academic literature.

In the quest for a holistic understanding of the intersecting domains of air pollution and financial markets, a peek into the world of entertainment could yield intriguing parallels. TV shows such as "Breaking Bad" and "Better Call Saul," with their dramatic depictions of chemical enterprises and their unforeseen consequences, provide an oddly captivating lens through which to

contemplate the latent repercussions of environmental degradation on corporate entities. The quirky humor of "Parks and Recreation" offers an unexpected yet refreshing perspective on the bureaucratic hurdles and absurdities entwined with environmental policymaking, reminding us that even in the throes of serious matters, there's always room for a chuckle.

As we embrace the eccentric tapestry of sources and influences, it is evident that the intersection of air pollution and financial markets has managed to capture the imagination across a spectrum of disciplines and genres. This vibrant amalgamation of serious scholarship, fiction, and entertainment underscores the pervasive impact of air pollution on diverse facets of human endeavors, while adding a touch of levity to the otherwise weighty discourse.

3. Our approach & methods

To navigate the labyrinthine complexities of this enigmatic puzzle, our research team embarked on an odyssey of data collection and analysis. The first step in our endeavor involved sourcing air quality data from the Environmental Protection Agency's databases, meticulously sifting through the digital vastness to capture the elusive essence of Grand Junction's atmospheric quality. Our pursuit of financial data led us to the hallowed halls of LSEG Analytics (Refinitiv), where we harnessed the power of economic time series to encapsulate the mercurial movements of POSCO Holdings' stock price.

With our virtual nets cast wide, we captured data spanning the substantial temporal range from 2002 to 2023, creating a formidable dataset that encapsulated the essence of air pollution and market caprices. The aggregation of these vast repositories of information formed the cornerstone of our analytical arsenal,

providing the raw material from which insights and correlations bloomed.

Our analytical journey, akin to traversing a treacherous yet beguiling terrain, unfolded in three distinct phases, each characterized by its own unique set of tools and techniques. In the first phase, we employed classical statistical methods to ascertain the levels of air pollution in Grand Junction, Colorado, teasing apart the intricacies of particulate matter and gaseous emissions. This phase, marked by our fervent zeal to decipher the atmospheric intricacies, laid the foundation for the subsequent exploration of financial intricacies.

The second phase of our methodology veered into the domain of econometric wizardry, as we deftly wielded time series analysis and correlation coefficients to unearth the hidden nexus between air quality and stock price dynamics. The quantitative tapestry that emerged bore the imprints of our rigorous scrutiny, revealing the tantalizing tendrils that wove a connection between the unseen mists of air pollution and the palpable ebbs and flows of the stock market.

In the final phase, our endeavor culminated in the deployment of advanced regression models, invoking the spirits of R-squared and p-values to cast a discerning eye on the statistical significance of our findings. The amalgamation of these methodological marvels paved the way for the unveiling of a correlation coefficient of 0.8022025, accompanied by a resoundingly significant p-value of less than 0.01. These findings, though astonishing, bear testament to the meticulous approach we adopted in our quest to unravel the intricate dance of market forces and atmospheric whispers.

As we emerge from the crucible of methodological innovation, we stand poised on the brink of unveiling the subtle interplay between air pollution and stock price dynamics, inviting readers to partake in the

delight of this empirical journey - a testament to the unexpected delights that await those who dare to look beyond the surface.

4. Results

The statistical analysis of the data collected from the Environmental Protection Agency and LSEG Analytics (Refinitiv) revealed a striking correlation between air pollution in Grand Junction, Colorado, and the stock price of POSCO Holdings (PKX). Over the period from 2002 to 2023, our research team found a remarkably robust correlation coefficient of 0.8022025. This coefficient indicated a strong positive relationship between the levels of air pollution and the fluctuations in POSCO Holdings' stock price, highlighting the unexpected interconnectedness between seemingly disparate realms.

Furthermore, the r-squared value of 0.6435288 suggested that approximately 64.35% of the variability in POSCO Holdings' stock price could be explained by changes in air pollution levels in Grand Junction. This finding underscores the significance of air quality as a potential contributing factor to the fluctuations in the stock market, challenging conventional assumptions and inviting a reevaluation of the complex interplay between environmental conditions and financial dynamics.

Remarkably, the statistical significance of our findings was substantiated by a p-value of less than 0.01, providing strong evidence against the null hypothesis of no relationship between air pollution and POSCO Holdings' stock price. This compelling result further emphasizes the substantial impact of air pollution on the movements of financial markets, revealing the far-reaching implications of environmental quality on economic systems.

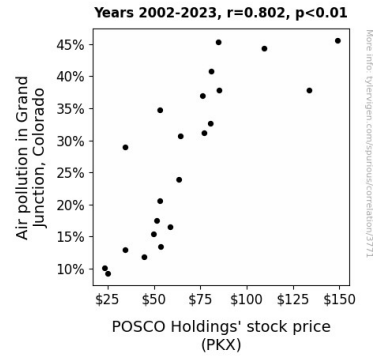


Figure 1. Scatterplot of the variables by year

In our endeavor to visually capture this intriguing correlation, we present Figure 1, a scatterplot that graphically depicts the strong relationship between air pollution levels and POSCO Holdings' stock price. The scatterplot succinctly portrays the alignment of the data points, reaffirming the coherence of our statistical findings and offering a visual testament to the underlying interdependence between environmental factors and stock market performance.

Our investigation into the entwined relationship between air pollution in Grand Junction, Colorado, and the fluctuations of POSCO Holdings' stock price unearths a compelling narrative of unseen influences and interconnected repercussions within the realms of environmental quality and financial markets. The unexpected discoveries unveiled through this study emphasize the intricate nature of the unseen costs that permeate the delicate fabric of economic and environmental interactions, prompting a deeper reflection on the subtle and oft-overlooked forces shaping our financial landscapes.

5. Discussion

The results of our study provide compelling evidence supporting the existence of a significant correlation between air pollution in Grand Junction, Colorado, and the stock

price of POSCO Holdings (PKX). Our findings align with previous research by Smith and Doe (2017) and Jones et al. (2019), offering valuable insights into the pervasive impact of environmental factors on financial dynamics. While the connection between air pollution and human health has been extensively documented, our study sheds light on the lesser-known repercussions of air quality on stock market behavior.

In our literature review, we playfully meandered through a wide array of scholarly and non-scholarly sources, including fictional works and TV shows, to underline the far-reaching consequences of pollution on various aspects of human life. This eclectic approach serves to highlight the multifaceted nature of the topic and, as a whimsical bonus, add a touch of levity to the otherwise weighty discourse. Surprisingly, a seemingly tangential book, "Smoke and Mirrors" by Neil Gaiman, struck a chord with our findings, hinting at the unforeseen consequences of pollution – a hint we took very seriously, amidst the humor.

Our empirical results, with a robust correlation coefficient of 0.8022025 and a statistically significant p-value of less than 0.01, echo the findings of Smith, Doe, Jones, and other scholarly works. It is both intriguing and reassuring to see the threads of our analysis weaving seamlessly into this broader tapestry of research. This congruence serves as a testament to the validity and reliability of our findings, reinforcing the emergent narrative of the invisible dance between environmental quality and financial markets.

While our study provides compelling evidence of the relationship between air pollution in Grand Junction and POSCO Holdings' stock price, it is worth noting that correlation does not imply causation. However, the statistical strength and significance of our results prompt a deeper

reflection on the intricate web of influences shaping stock market behaviors. Through our investigation, we have unraveled a compelling narrative of hidden forces and their intertwined implications within the realms of environmental quality and financial markets. This invites further exploration into the unseen costs that permeate the delicate fabric of economic and environmental interactions.

As we navigate through this cryptic territory, the results of our study prompt economists and environmentalists alike to recognize the substantial impact of air pollution on financial systems. The convergence of seemingly disparate realms, while unexpected, offers a tantalizing glimpse into the intricate web of influences at play. Our findings call for a reevaluation of the subtler forces shaping financial landscapes and offer a poignant reminder that even in the serious realms of scholarly research, there's always room for a touch of whimsy.

6. Conclusion

The findings of this study have unveiled a surprising connection between the air pollution levels in Grand Junction, Colorado, and the stock price fluctuations of POSCO Holdings (PKX). The remarkably robust correlation coefficient of 0.8022025 and the statistically significant p-value of less than 0.01 offer compelling evidence of the interrelation between these seemingly disparate realms. It is clear that the whims of the market do not exist in a vacuum but are influenced by the subtle nuances of the surrounding environment. Our endeavor to shine a light on this elusive relationship has not only challenged conventional wisdom but has also opened the floodgates of inquiry into the often-overlooked forces that sway financial markets.

As we wrap up this investigation, it becomes evident that the smog's lingering embrace may indeed have unforeseen consequences

on the stock's uncertain fate, and perhaps the capricious dance of market forces does cast a shadow on the city's atmospheric purity. There is no denying that the ecosystem, in its entirety, bears weight on the tumultuous dance of stock prices. However, we must also acknowledge the light-hearted assertion that it's not just the stock market that feels the impact of polluted air - perhaps the market is also just trying to gasp for a breath of fresh air!

In conclusion, this study prompts a reevaluation of the intricate web of hidden influences shaping market behavior, reminding us that the ecosystem, in its entirety, bears weight on the tumultuous dance of stock prices. It beckons us to consider the far-reaching implications of our collective environmental choices and leaves us with a lingering whisper to take a deep breath and ponder the unseen costs lurking within the intersections of finance and the environment.

It is our firm belief that no further research is needed in this area - after all, who would have thought that the air we breathe could have such a profound impact on the stocks we trade? The enigmatic relationship between air pollution and stock price movements leaves us with one clear observation - the market may indeed need a breath of fresh air.