Source Evaluation #3

**Research Question:** How does cryptocurrency affect our global climate?

**Citation:**

Mustafa, Fairouz, et al. "Coupling of cryptocurrency trading with the sustainable environmental goals: Is it on the cards?" *Business Strategy and the Environment*, John Wiley & Sons, Inc, 2020, https://doi-org.proxy.libraries.rutgers.edu/10.1002/bse.2947.

**Information on the Author:**

Fairouz Mustafa is a doctoral researcher in accounting at the Brunel Business School of Brunel University, London. Her expertise is in accounting information system and FinTech.

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Dr. Monomita Nandy has completed two PhDs from the University of Calcutta, India and the University of Rome Torvergata, Italy. Her expertise is in interdisciplinary research and technological advancement in emerging issues in corporate finance, accounting, and banking. She is now a reader in accounting and finance and the director of internalization at Brunel Business School, Brunel University, London.

Dr. Vikas Kumar is the director of research and professor of operations and supply chain management at the Bristol Business School of University of the West of England, UK. His qualifications include a PhD, AHEA, ALTE, and B.Tech.

**Summary of Paper:**

Mustafa et al. explore whether the profits of cryptocurrency mining can help with the United Nation's (UN) plans of sustainable development. They format their explanation with an introduction of the UN's 2030 sustainable agenda and how their sustainable development goals are related to green energy and climate change risk. They then go on to include how different factors of the cryptocurrency market, such as the Covid-19 pandemic, have plunged society with economic uncertainty and the subsequent farming of cryptocurrency. They also bring up the specific goals of the UN that they are addressing – goals 7 and 13. Next, they introduce their study that finds links between cryptocurrency wealth and goals 7 and 13 of the sustainable development plans (making good progress on increasing access to electricity and improving energy efficiency and implementing a commitment by developed countries to fund the needs of developing countries). This is the largest section, that goes over the methodologies of the study, outcomes, and analyses. Lastly, they provide a conclusion that summarizes their paper and findings, and that there is a possibility of such a link. The main method they use to persuade the dangers are by showing examples of what could happen if nothing is done. Rising temperatures and increased greenhouse gas emissions are the biggest factors. They also use a lot of data to back up their claims, and so they have a great deal of information on how their findings and methodologies accurately reflect the real world.

**Key Terms and Concepts:**

United Nations: The United Nations (UN) is a global organization created in 1945 that allows each country to represent themselves on a global scale, express their independent views, and collaborate with other countries on international projects. Their main mission is to maintain international peace and security, develop friendly relations among nations, promote social progress, better living standards, and promote human rights. Specifically, their focus on living standards is expressed in this paper.

Sustainable Green Energy: Green energy refers to sustainable, or renewable energy. These are energy sources that do not use limited resources (such as the burning of fossil fuels), and therefore do not change the energy needs or climates long-term. Sustainable energy sources include wind power and solar energy. Although most green energy sources are also renewable, not all renewable energy sources are green.

Climate Change Risk: Climate risk includes the consequences, the likelihoods, and the responses to the implications of climate change and how society will adapt as a result. Climate change is changing ecosystems globally and by 2030 will be rising average global temperatures, rising sea levels, and overall creating a more polluted environment for all of life. This is the main frame of the authors paper, as they are warning the public and legislators of the risk that cryptomining operations pose on climate change.

Cryptocurrency mining: Cryptocurrency mining, is when new units of cryptocurrency are made. Highly efficient hardware and software is tasked with complex mathematical problems called hashes, and solving these problems rewards the miners with the cryptocurrency. The math problem specifically is the encrypted serial number of the next block on the block chain. Decrypting it, which takes lots of effort, time, and energy, unlocks the bitcoin.

**Quotes, Paraphrases, and Analyses**

In their introduction, the authors call for a change in how energy is used.

“There is an urgent call for companies to work on the environmental and societal issues collectively so that [materialization] of SDG achievement can be attained by 2030. As per the UN global agenda, companies should focus on generating and using renewable energy and carefully [minimizing] the emission of carbon dioxide in the environment” (Mustafa et al. 1).

There is a call to action introduced that asserts that businesses and corporations should keep renewable energy and energy saving measures in mind, as to help the UN reach their goals. More importantly, the UN’s goals are in the interest and benefit of everyone’s health and safety worldwide, and so the short-term political and corporate greed of those that pollute the world is only short-lived. Bitcoin is perhaps only a short-term endeavor for most, the emissions it generates however cannot be recovered.

In their introduction, the authors also go into a large reason why Bitcoin has taken importance in the progress of lowering emissions,

“During the pandemic, we observed a sharp rise in cryptocurrency trading among individual and institutional [investors]. Higher volatility in traditional stock markets and difficulty in finding a safe haven during the pandemic allowed investors to focus more on the internet-based cryptocurrency trading facilities” (Mustafa et al. 1).

The Covid-19 pandemic has greatly increased the sales and transactions of cryptocurrency, not only from individuals hoping to divide a small profit, but from institutional investors as well. This means that just in the last few years, cryptocurrency mining rates have been booming. This, coupled with the fact that electricity usage worldwide has exponentially increased due to work-form-home and quarantining rules, results in a huge burst of emissions being released; this is more reason to regulate the energy consumption of cryptocurrency.

When discussing the findings of their study, the authors make one important note, “However, when the financial resources are limited, mainly in an emerging [market], we observe the popularity of cryptocurrency trading in these markets, which can motive the miners to use renewable sources instead of fossil fuels” (Mustafa et al. 1). The rise of cryptocurrency in open markets where standardized and centralized currencies face issues can also somewhat contribute to renewable energy usage. Not only is this beneficial for the environment and the goals of the UN, but it also helps spread the usage and long-term benefits of renewable energy usage to other industries.

**Synthesis**

This text and Stoll et al.'s “The Carbon Footprint of Bitcoin” explain in depth how each group of author’s independent case studies contribute to the idea that cryptocurrency mining is driving climate change. The biggest similarity is that they are both case studies – independent methods and algorithms were created, compiled, used, and analyzed to come to similar conclusions, confirming that there are likely no errors in the process. These studies confirm that the answer to my research question is that there is a discernable link between cryptocurrency and climate change. Stoll et al. used the independent information of certain countries and their demographics to accurately chart how much emissions per capita mining created. Mustafa et al. Additionally, both tack a call of action on to their conclusion for increased use of renewable energy sources, though this evaluation’s paper goes beyond to add how renewable energy sources for mining are already being practiced.

**Overall Evaluation of Source**

Overall, this is a strong source for my research project. The case study that the authors have come up with and analyzed can directly be applied to my research question. There is sufficient background information to reference as well, to ensure that all the topics and ideas that are addressed in my paper are thoroughly explained. The frame of the authors paper is climate change. Their main paper goes through with the effects of mining and sustainable environment goals, but climate change is ultimately what is driving their paper and is also the result of failure to stick to said goals. Climate change is the reason for the UN’s goals in the first place and so the authors revolve their paper around this central idea. There are also other types of change mentioned, such as economic and financial change, but everything comes down to the implications of carbon emissions and climate change.

The biggest limitation to using this paper as a source is it relies too heavily on the United Nation’s specific goals and agendas, these being goals 7 and 13. I would have preferred if the authors also connected their analyses with other types of goals, for example targeting individuals who utilize their persona equipment to drive climate change on smaller levels. There is also not a lot said about how individuals can improve the current state of cryptomining and its effects.

The biggest surprise that I got from this source is that the biggest limitation to their study was the lack of research and/or papers written about this topic specifically. The authors say that there is a lack of numerical data as well, which limits the application of an empirical model for some of their goals.

This source is very recent, as it was published in November of 2021. Unlike the previous sources, it has been written after the advent of new hardware and exponentially increased mining rates due to the pandemic. This makes it a stronger source than the previous two. This paper references about ninety sources in total.

There is a huge range, ranging from other case studies, research papers, technology journalism, and magazine issues. Out of these, I found a few interesting sources. One source was from the “International Criminal Justice Review”, a paper regarding the rise in popularity of cryptocurrency and associated criminal activity. However, I don’t see this being applicable directly to my research question. Another source that can be, however, is “Envisioning the UN Sustainable Development Goals (SDGs) through the lens of energy sustainability (SDG 7) in the post-COVID-19 world” by Elavarasan et al. This source is broader as it contains a multitude of factors that should be considered when finding deterrents to UN’s SDG 7.

This paper could be useful to my research question if there are other factors that both relate to cryptocurrency/cryptomining and have to do with sustainable energy usage / SDG 7.