Docker: Version and Security Upgrades with Containerized Applications

Crime is the Driving Factor of Cryptocurrency Adoption

A Thesis Prospectus
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Presented to
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Bachelor of Science in Computer Science

By
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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Crime is the Driving Factor of Cryptocurrency Adoption

Problem statement:

Cryptocurrency adoption varies significantly by nation. One major factor for varying adoption is inflation; Vietnam currently has the highest rate of cryptocurrency adoption in the world, and inflation rates in Vietnam have oscillated wildly year to year from 0.6% to as high as 19.89% since 2000 (Dat, 2020). Distrust of the government as an institution showcases another potential factor in understanding why adoption rates vary so wildly nation to nation. Citizens living in nations with low levels of trust in government may value the decentralized nature of cryptocurrency, as, apart from the Venezuelan Petro, the value of cryptocurrencies is independent of the monetary policies employed by untrusted governments. The inverse is likely also true; citizens living in nations with higher levels of trust in government put greater faith in conventional fiat currencies compared to cryptocurrency. In my research, I will seek to understand how central bank monetary policy, distrust in government, and other factors influence the different utility and perception of cryptocurrencies across national borders and to investigate what technical improvements can be engineered to lessen those differences.

Commented [WKA(1]: To what extent should we consider Vietnam a capitalist country now? Is that worth considering?

Commented [HC(2R1]: That's an interesting point but Vietnam seems to just use the same central bank economic theory that must capitalist nations do so I do think its fair to compare them, but I am not sure if I should explicitly state that assumption in the Prospectus.

Technical portion:

Can a cryptocurrency employ a dynamic self-regulating money supply growth algorithm to make it a more viable medium of exchange?

Cryptocurrency adoption in nations with stable inflation is primarily motivated as an investment asset as opposed to a medium of exchange. A major reason for this is likely the large price volatility that cryptocurrencies experience, weaking its utility as a medium of exchange by reducing the stability in prices that modern monetary exchanges rely upon (Berentsen & Schär, 2019). The technical problem I hope to solve is to find out if there exist potential mechanisms a cryptocurrency design could employ to dynamically regulate its own growth to counteract

volatile price cycles. In essence, I want to find out if a cryptocurrency could make itself more difficult to mine and decrease its money supply when the price is falling rapidly, and conversely, make itself easier to mine to increase money supply when price is raising rapidly. I think designing the technology in such a way it regulates its own inflation to respond to price changes would make cryptocurrency more attractive as a medium of exchange and could potentially reduce the differences between actor networks between different nations.

To collect data for this question, I will primarily employ scholarly articles, enroll in CS 4501: Cryptocurrency taught by Professor Aaron Bloomfield next semester, and read documentation of open-source cryptocurrency algorithms. Other methods could include direct interviewers with programmers and designers of cryptocurrency and further research into the economics of a stable price cryptocurrency.

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STS Portion

How does central bank monetary policy and the amount of trust citizens have in their government affect the socioeconomic function and adoption of cryptocurrencies across different nations?

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It became clear in research that there were major differences in how different societies viewed the economic utility of cryptocurrencies. In Venezuela, a nation experiencing hyperinflation, there seems to be much higher propensity to view cryptocurrency as a medium of exchange (Wulf, 2018). However, in nations such as Indonesia with low levels of inflation, cryptocurrencies serve more as an investment asset, with the only significant actors utilizing it as a medium of exchange being criminals who value the privacy of the technology (Kusumastuty et al, 2019). A gap in the research is a lack of cross-national analysis that analyzes the differences of currency stability and its effect on cryptocurrency adoption. In addition, there is a lack of

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cross-national analysis of the relationship between trust in government and cryptocurrency adoption. In specific, I am interested in understanding what societal and institutional differences affect the discrepancy in adoption of cryptocurrency between nations.

Actor Network Theory will be a central pillar of my cross-national analysis. I believe this theory is appropriate because of the central role of cryptocurrency, a non-human actant, and its relationship with humans. Actor Network Theory allows me to organize the complicated relationship between all the various actors involved: cryptocurrencies, users of cryptocurrencies, central banks, and national governments. In addition, setting up an actor network for many nations with the same actors will make the differences between the relationships of those actors in different countries clearer. This clarity is essential for adequately answering the STS research question in terms of the differences between nations. Each of these Actor Networks will be mapped one by one as they developed historically. Once they have been mapped, I will compare the similarities and differences across the networks and highlight common factors. I will choose nations to build these actor networks such that I can represent a broad spectrum of the different factors I am analyzing. I am very interested in a nation with high inflation and a low level of trust in government, such as Vietnam or Venezuela, a nation with low inflation and low level of trust in government, a nation with high inflation and high level of trust in government (this one may be more difficult to find), and a nation with low inflation and high level of trust in government, such as Norway or the Netherlands (the government trust level in these example nations is based on OECD polling but in the STS research paper I would spend greater care and consideration on attempting to understand the level of trust citizens have in their government.

The first major relationship between actors in the network is between central bankers versus cryptocurrency users. This is often manifested as the effect of inflation on cryptocurrency

Commented [WKA(6]: You should explain this a bit more. You will map these actor networks, as they developed historically? It's usually a process of tracing the forming of alliances over time.

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prices as the central bank has a pivotal role in controlling inflation. In Indonesia, higher levels of inflation had a statistically significant impact on Bitcoin adoption (Kusumastuty et al, 2019). High inflation in local fiat currencies makes certain limited growth cryptocurrencies more appealing as a medium of exchange. To counter hyperinflation, the Venezuelan central bank created the Petro, a centrally controlled digital currency that would be tied one to one to the value of a barrel of oil. However, adoption of the Petro is limited due to it violating a traditional tenet of cryptocurrency: being decentralized and out of government control (as the Venezuelan government can change the supply, and therefore price, of a barrel of oil). Additionally, Petro adoption has been limited by foreign nations pressuring crypto brokers outside of Venezuela to not to accept the Petro (Tomić et al, 2020).

A subcomponent of the relationship between central bankers and cryptocurrency is the ability for central banks to set exchange rates. This ability to set exchange rates could potentially be a factor in cryptocurrency adoption. In the United States of America, the Federal Reserve, the central bank of the United States, does not centrally set exchange rates between currencies in favor of market decided rates. In Argentina, the Banco Central de la República Argentina tightened centralized exchange rates in 2012 and has experienced a high degree of cryptocurrency adoption (Pieters, 2016). However, this link needs to be further researched to include the central banks of other nations and as with such a small sample size, confounding variables may muddy the suggested link.

A second major relationship in the actor network is the level of trust citizens have in their government and how this level of trust affects cryptocurrency adoption. This relationship is why cross-national analysis is so central to the STS question; cross national analysis gives me the opportunity to analyze different attitudes citizens of the world have toward their governments

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and how these attitudes effect the utility of cryptocurrencies. The trust that citizens have in their government is how fiat currency works; users of that currency trust that their government will guarantee its value, allowing for long term price stability. Cryptocurrency does not yet have long term price stability, and as a result, its utility as a medium of exchange is low (Berentsen & Schär, 2019). I will investigate the attitudes that citizens have towards the government so that I can further understand how cryptocurrency adoption would vary between nations if price volatility was substantially lower. In essence, if cryptocurrency was a valid alternative to fiat currency, I think that the trust level that citizens have in their government affect whether they would continue to use fiat currency or transition to cryptocurrency. This connection within the actor network will be analyzed by comparing the cryptocurrency adoption for a less price volatile cryptocurrency between nations with varying trust levels in their government.

The methods used to collect data for the question will be primarily scholarly articles on cryptocurrency and economic anthropology as well as primary sources from local newspapers or magazines. Other methods could include analyzing crypto exchanges marketing in different nations. If cryptocurrency ownership is marketed as a means of financial independence from the government, this could indicate lower levels of trust in government. Analyzing trust levels in government will be achieved by reviewing OECD and Pew Research polling data. When choosing nations to build the networks, I will review regulatory stances of each of the nations chosen such that they have limited to no regulation on cryptocurrency so that I can focus on the factors of level of trust and inflation.

The primary method of analysis will be mapping the actor network theory within different countries and then analyzing the differences between the networks created. This method is useful because it will clearly illustrate the differences between the networks. To examine these

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Commented [WKA(12]: You need to explain a bit more what this would look like. As I noted above, usually ANT involves developing a historical narrative of the alliances between actants. Would you be comparing presence/absence of certain alliances? Just a little more explanation would be helpful.

differences, I will compare the presence and absence of certain alliances in each network. I will likely have to become pickier about what nations I chose to limit the overall number of networks created and to make the resulting data clearer but as I mentioned above, I would like to have at least four so I can represent the spectrums of levels of inflation and trust in government. Ideally, I would be able to pick nations with big differences on those spectra, however, I will likely be limited by whatever primary sources I will be able to find.

To conclude, the STS research question is to examine the effect of the level of the inflation and the amount of trust citizens have in their government on the socioeconomic function and adoption of cryptocurrencies across different nations. To answer this question, I will build at least four actor networks with the same actors so that I can compare the differences in the relationships between those actors in each nation. The technical question focuses on developing algorithmic solution to price volatility of cryptocurrency so that cryptocurrency has a greater utility as a medium of exchange. To answer the technical question, I research current approaches as well as hopefully take the cryptocurrency elective, as it will allow me to understand the technology better and hopefully strengthen my understanding and analysis of my STS research question. Together, the STS and technical portions will research what factors affect cryptocurrency adoption across nations and whether price volatility as a limiting factor in cryptocurrency adoption can be lessened.

Commented [WKA(13]: It would be helpful if you could bring in the overarching topic/issue as well.

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