Crypto Currencies and their impact on the stock market.

My project is based on how crypto currencies interact with the market and if they have an impact on the price of the market or not.

Crypto currencies are online currencies that are mined, validated, and then traded or spent on different goods and services. The first step in getting cryptocurrency is one of two things, one you can buy the currency from another person, or you can mine the currency. This means that you have a computer solve complex equations to try and decipher different codes so that you can get cryptocurrency. The next step in getting the currency provided you elected to mine the currency rather than just buy it from a different person is to have your solution of your computer to validate the chain code that you got from your computer this allows you to add a coin to your cryptocurrency wallet. The final step is to just store or use your coins to buy the goods and services that you want.

There are many different crypto currencies that have different prices, but most of them are gathered the same way. The crypto currencies that I used in this project are Bitcoin, Ethereum, and Dogecoin. The reason that I use each is for a different reason. The first one that I used was Bitcoin, I used this cryptocurrency because it is the original cryptocurrency and is one of the most popular and stable of all the crypto currencies in the market. Another reason that I used bitcoin is that it is the most valuable cryptocurrency in the market. The next one that I used is Ethereum, I used this one because it is the second most valuable cryptocurrency on the market and is the second most popular cryptocurrency also it is one of the most useable crypto currencies that you can have. The final cryptocurrency that I used was Dogecoin. I used this one because it the most affect by the public opinion and is only based on what the public determines to its price this is because has no max on the number that can be in the market, this is unlike the other crypto currencies that have a max number that can be in the market which leads to scarcity.

My project is to look at the correlation between crypto currencies and the stock market. I will do this in multiple ways, one looking at the rise and fall of the price of multiple different crypto currencies, another way is looking at the stock market at the same time as the cryptocurrency rises and falls to see if there is any correlation between the two. This makes the puzzle that I am looking to solve the relationship between the crypto market and the stock market. I did this by conducting several steps which are as follows, step one gather the data that I would use for the crypto market and the crypto currencies, the next step was to gather the data that I need to use for the stock market, the next step was to plot the data that I collected, the final step was to run the data through the stat models to see which variables are significant and which ones have little to no affect. The data that I got was from yahoo finance. This is due to ease of access.

The first visualizations that I used were to look at the Bitcoin data and the trend of the close data by plotting the data on a graph of price versus date we can look at the close data for bitcoin. I repeated this process of printing out a table and plotting a graph. These are shown in the next couple of visualizations for the remaining crypto currencies and the total crypto market as well as the different market indicators that I used.

The different stock market indicators that I used were the S&P 500, the Dow and the Nasdaq. The reason that I used three different indicators is so that I would have a verity of information to have to for my different models. Another reason to use the different indicators is because it allows for better looking plots meaning different prices can be modeled better with different plots.

The next group of visualizations is bitcoin plotted against stock market indicators. This visualization is important because it shows the trends of bitcoin and the market. The best one to look at for bit coin is the Dow and bit coin one because this one has closed enough values that you can see the trends the best and by looking at the graph you can see how there could be a correlation between the two in the price of each. This is because both have similar trends and when one dips the other one normally follows the trend. The other graphs also kind of show this up it is less clear because the value of each is too far to get a nice looking graph.

The next visualizations are of the other crypto plotted against the market indicators. In these visualizations are not as useful as the bit coin ones because it is harder to see the trends due to the values that that each line has, but you can see that Ethereum also follows a similar trend as bit coin did with relation to the market. When you look at these visualizations you might think that the value of doge is constant it is not it just looks that way because the value of it is tiny when compared to all the other markets.

The model hypothesis that I used was that the crypto market has no impact on the stock market. The other null hypothesis that was part of this project is that bit coin has no impact on the stock market. Ethereum has no impact on the stock market and that doge coin has no impact on the stock market. This would make the alternative hypothesis for this project that at least one of the crypto currencies has an impact on the stock market.

The testing of these hypotheses is in the next group of visualizations. These show the effect each of the variables has on the crypto market. As you can see in the visualization the main impacts that are part of the model are Ethereum, the Dow, and the Nasdaq. This means that there is a market that does have an impact on the cryptocurrency market.

The visualizations that are after the first model are the predictor and the residuals for the crypto market. This means that the predicted values for the crypto market and the residuals for the crypto market are calculated so that it is easier to the effects of the different variables on the crypto market. Next, I calculated the squared values for the market I did this by calculating the three different kinds of squared values which are the explained, the residuals, and the totals. I did this for each observation in the set this is important part of the project because it helps to view the whole model and not just one type of model. The next step that I did was to calculated the total or the sum of each of the squares so that it would be easier to set up visualizations in the future. After this I calculated the r squared and the r squared adjusted values so that it could be plotted. After the r squared and the r squared adjusted I plotted the residuals on a graph to look at the distribution of them this allows us to look at the different amounts and how the residuals are related. I did the same for the squared residuals to again look to see the distribution of the them so that it can better help understand the correlation between the two markets.

After I finished the first model I ran a similar model to help compare the two to see if there was any differences and if there were what were they. To do this set up the same system as before just using a different system of code to run the program and look at the results.

The final thing that I did was to run the high value against the close to see if they are related and it turned out that the two can be related but do not have to be. This the result that I expected form the test but it was smart to run the test anyway to see if anything would be different.

The outcome from this experiment is that the crypto market is affected by the stock market and crypto currencies do play a role in the stock market but are not directly influence the market any more than a stock would. This was also found by other research on the same or similar topics.

My project is trying to see if there is any correlation between the cryptocurrency market and the stock market and the GDP of the country. I will do this in multiple ways, one looking at the rise and fall of the price of multiple different cryptocurrencies, another way is looking at the stock market at the same time as the cryptocurrency rises and falls to see if there is any correlation between the two.

The first major part of this is that I will look at multiple different cryptocurrencies to help create an overall view of the cryptocurrency market. The reason that I will look at different cryptocurrencies and make a view of the market is that I can control which ones are in the data, this leads to a more stable view of the market as a whole but the drawback is that the data will not show the whole market in the visualizations. I will also use the api’s that are available online to create another visualization of the market but as a whole, this is because it will give me a more accurate representation of the cryptocurrency market as a whole rather than using the two most stable ones. The reason that I will be using both the one I generate and the one that I get from the api is that it will show if the two highest priced ones have more or less correlation to the market as a whole.

The cryptocurrencies that I will be using to help form this view are bitcoin and Ethereum. The reason that I will be using these two to form my base of the cryptocurrency market is that these are the two with the most possible uses outside of trading. Another reason that I will be using these two cryptocurrencies is that they are some of the more stable cryptocurrencies in the market. The final reason that these are the two that I will be looking at is that they are the two that cost the most in terms of the USD, this could be a part of the reason if they have any correlation to the market and its activities.

In the first visualization above the data shows bitcoin prices per month going back to the beginning of the trading that was available on yahoo which is in October of 2014 and this continues until the most recent start of the month which is at this time February of 2023. The table shows the data in seven different columns each representing a different thing. The first column is the data this is the first of each month going back to October of 2014. The second column is the opening price of bitcoin on that day, this means what the price of bitcoin was at the start of trading in wall street. The third column is the high this means the highest price that it reached during the day of trading. The fourth column is the lowest price that it reached during that day of trading. The fifth column is the close price which is the price that bitcoin was at during the end of the day or when wall street closes for the day. The sixth column is the adjusted close, this column is not important. The final column is the volume, this is the amount of bitcoin that was traded during the day this column is one of the columns I will use to see if the activity in the cryptocurrency market matches the activity in the stock market.

The second part of my project is that I will be looking at the stock market rises and falls. The reason that is will be doing this is that I will look at the stock market to get a baseline to see if the cryptocurrency market has any impact on the market or any correlation between the rises and falls of ether market to one another. The way that I will be looking at the market is by taking the data form the Nasdaq, the s&p and the Dow and looking at each one separately and then taking all of them and averaging them to create a picture what the market is looking like on any particular day.

Another part is that I will take the GDP from the fed and plot it out to see if it is related to any of the cryptocurrencies that I am looking at or if it is unaffected by them. The reason that I will include the GDP in my project is that I will use it to look at the whole economy and not just the stock market or the crypto market when I review if cryptocurrencies do or do not have any impact on the market or the economy.

In the second visualization is the representation of the GDP of the country per year from 1990 to 2023. This is an important visualization because it will be part of the baseline in testing the bitcoin price that is show in the first visualization against the rise and fall of the GDP, as well as it could be useful in showing market trends that could be part of the crypto market.

To recap my project is to take the data from yahoo on bitcoin, Ethereum, the cryptocurrency market, the Nasdaq, the S&P, and the Dow. To see if the cryptocurrency market has any affect on the stock market or the GDP. I will do this by taking each cryptocurrency and placing it up against each market representative and the GDP to see if there is any correlation between them. I will also use them to create an overall view of each market and compare each one to another. The boundaries that I will use for the project will be limited to the amount of data that I can find for the project. Most likely it will be that I cannot find data for the cryptocurrency as far back as I can find for the market or the GDP of the country.