Crypto Interest by US Geography

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1 Introduction

Crypto has undoubtedly hit the mainstream with about anyone able to purchase and use a variety of coins. Estimates by Pew Research show that nearly 1 in 5 Americans have had invested in, traded, or used cryptocurrency [1]. But the question remains, is adoption truly becoming mainstream across the entire United States, or is the market heavily concentrated in a few select regions.

Without access to wallet location of every single individual in the US, we can use a proxy to understand interest and sentiment toward specific crypto currencies and markets. For this analysis we will use Google Trend data and look at search intent over a five year period across the United States. This data will allow us to see regions in the United States that are most heavily searching for certain currencies and markets.

Research has shown that Google searches for cryptocurrency does move in lockstop with value of certain currencies. A 2017 study found, that bitcoin prices had a 91 percent correlation with the volume of Bitcoin-related Google searches. This means that the price of bitcoin rose and fell in lockstep with the number of Bitcoin-related searches.

We use Google trends data for our searches to compare location intensity by search and find that certain regions in the United States searched for crypto currencies and exchanges at a higher rate than other regions. We show that state population is not the only driver of higher search intensity.

2 Data and Methods

2.1 Google Trend Data

We start with the reasonable assumption assuming that an individual searching for a particular currency will lead to purchasing or interest in that particular coin. While this relationship is not 1:1 (i.e., the proportion of people searching Google for a specific coin who actually obtain the coin will be far less than 100 percent), we use this search as a rough proxy to understand interest and potential future purchase opportunity or adoption.

2.2 How to interpret Trend data

Using Google trends allows us to see searches by intensity for a particular keyword or phrase in a specified geographical area. Google Trends data provides an unfiltered sample of search requests made to Google. It supplies an index for search intensity by topic over the time period requested in a geographical area. This is the number of daily searches for the specified topic divided by the maximum number of daily searches for this topic over the time period in question in that geographical area. This is scaled from zero to 100 [2], where 100 is the day with the most searches for that topic and zero indicates that a given day did not have sufficient search volume for the specific term. Google search data shows aggregate measures of search activity in a location (e.g. a State or Country), and is thus less vulnerable to small-sample bias. (Brodeur, Abel, et al, 2021)

[1] https://www.pewresearch.org/short-reads/2023/04/10/majority-of-americans-arent-confident-in-the-safety-and-reliability-of-cryptocurrency/

[2] Google Trends normalizes search data to make comparisons between terms easier. Search results are normalized to the time and location of a query

2.3 Trend Data by Intensity

The following search terms were used in our analysis: Coinbase, Bitcoin, XRP and Solana. Data from January 1st 2019 to February 2nd, 2024 were used in our analysis as the time-period for our range of interest. A five year period was used to capture variation over time while also attempting reduce the noise of multiple search teams within the same time period that that may be the result of a quick news hit. We only looked at data in the US geography.

It is of importance to note that the population in the United States is not concentrated equally. Some states are more populated and population density within these states are not equal by location. Using 2023 estimates of the US population, the top five most populated states are listed below [3].

State	Estimated Population
California	38,965,193
Texas	30,503,301
Florida	22,610,726
New York	19,571,216
Pennsylvania	12,961,683

Table 1: Estimated State Populations - 2023

3 Analysis

Figure 1 below (using gtrends package [4]) shows interest over time using the keywords mentioned above.

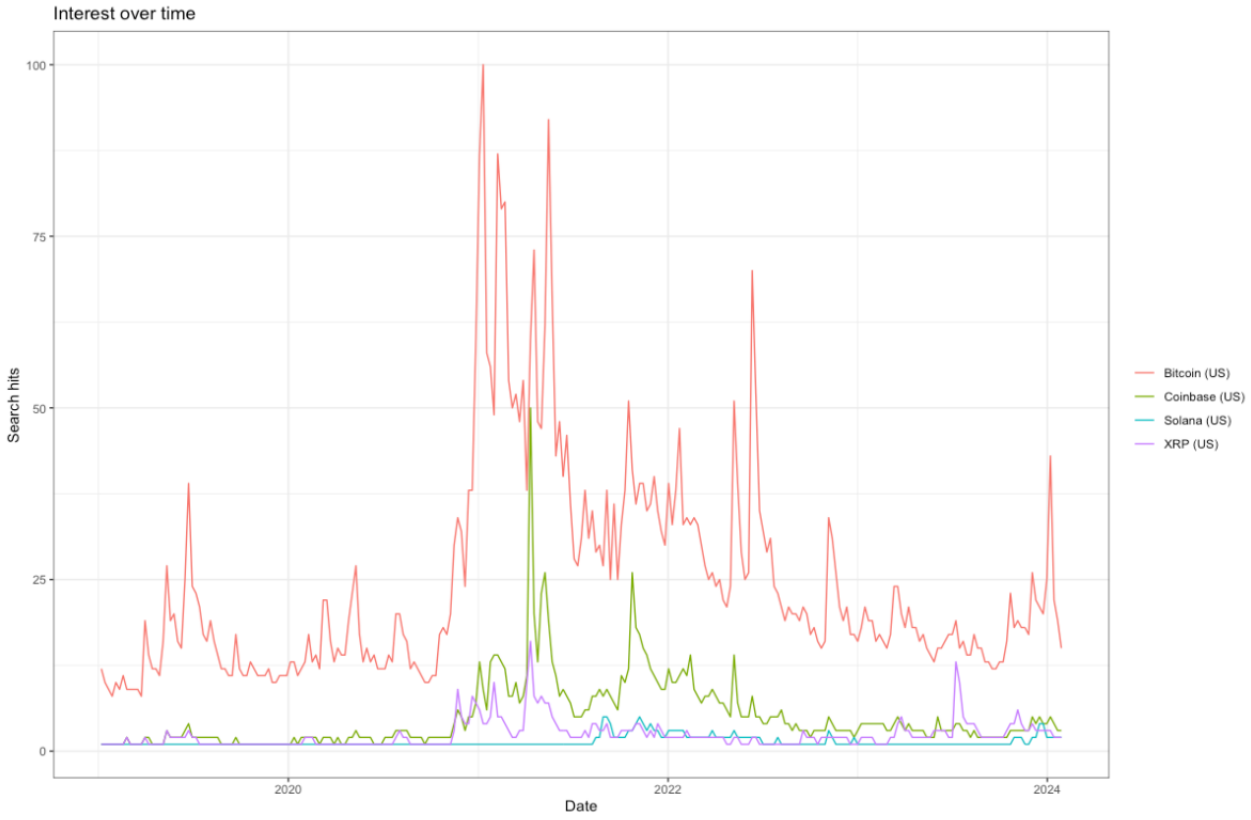

Figure 1: Terms by Intensity

As shown in Figure 1 - Bitcoin (BTC) has dominated the other coins and exchanges by pure search intensity. This could be because Bitcoin has existed and has seen a longer adoption period compared

[3] https://www.census.gov/popclock/
[4] https://cran.r-project.org/web/packages/gtrendsR/index.html

to the other coins. However, from about 2021 onward we see, it still dominates the searches. All coins saw an increase in searches in late 2020 going into 2021, as purchases increased partially due to an increase in trading interest and adoption partially attributed to Americans flush with covid era cash.

Coinbase sees a noteable spike in intensity in early 2021, this spike could be attributed to Coinbase going public in April of 2021. We don't know with these searches, whether people are interested in purchasing coins through the exchange or are more interested in the company from a stock standpoint. Like BTC searches and value, research has found that "an increase in Google search is positively related to future excess stock returns, liquidity and volatility. The positive influence of Google search on stock prices, however, is temporary and reverses in the next week". (Aziz,Tariq,et.,al, 2021)

Other coins see similar spikes that are in tandem with noteworthy events that affected that particular coin. For example, XRP (Ripple), saw a spike in interest in late 2023. In July 2023, a US district judge ruled that Ripple did not violate federal securities law by selling XRP on public exchanges. [5]

3.1 Search intensity by Geography

Google trends data also allows a user to look at intensity by region. A higher "hit" rate in a specific state, means that particular state searches for that term at a higher rate than the next state, etc. One would hypothesize that a term such as "Bitcoin" would be searched for at a higher rate in more heavily populated state. This analysis does not entirely support this hypothesis. While some states that are heavily populated, do show a higher search intensity, this does not hold across all states.

Take the search intensity by region for "BTC" - as shown in the table below, search intensity is highest in Nevada, followed by Hawaii, whereas those states are not even top 10 in most populated states.

State	Hits
Nevada	100
Hawaii	99
California	96
Washington	87
Florida	83

Table 2: Search Intensity by State Level - BTC

While these states have higher search intensity we deduce individuals in these states have a higher interest in Bitcoin than other states. Yet it is not explainable from this data, why individuals in some states are searching at much higher rate than heavier populated states.

The regional search intensity does not follow across all terms equally either. While one would assume that a state with a higher search intensity for BTC, may also see a higher intensity for an exchange, but this does not carry over entirely. As shown below, Hawaii and Washington do not look up the exchange with as heavily as they look up BTC. And again, neither Hawaii or Washington are near the most populated states.

State	Hits
Nevada	100
California	96
New Jersey	91
New York	91
Florida	88

Table 3: Search Intensity by State Level - Coinbase

This trend does not follow a logical pattern across coins either. As shown below, Solana the lowest searched coin of any used in our analysis, is heavily searched for in Ohio, Nevada and Montana. All states that have smaller populations but also do not search for the other coins at the same rate.

XRP also sees variation by state level but does follow very similar to BTC, with all states except New Jersey being the biggest searchers for both BTC and XRP.

[5] https://www.reuters.com/technology/us-sec-developing-rules-ai-conflicts-interest-2023-07-17/

State	Hits
California	100
Ohio	47
Rhode Island	41
Nevada	38
Montana	37

Table 4: Search Intensity by State Level - Solana

State	Hits
Nevada	100
Florida	81
Hawaii	80
California	77
New Jersey	73

Table 5: Search Intensity by State Level - XRP

In all our searches - Nevada is top five for search intensity despite having an estimated population of 3.1 million people. States such as New York that are heavily populated, and often viewed as trendsetters, are not the top searcher of the coins analyzed here. This supports that coin interest and adoption is not driven just by larger locations.

4 Discussion and Future Work

This research can continue to help fill a knowledge gap on the adoption and interest of crypto currency across the United States. We show that interest in coins is not driven by the most populated locations. From a marketing or planning perspective this supports that adoption may not occur in the same way across coins or regions. Exchanges could use this data to understand conversion of purchasing after interest in a particular coin. For example, if search intensity for a newer coin was high - but purchase on their exchange was low from those in the same area.

Future work could also analyze intensity at a more granular, metropolitan level within states with high metropolitan populations including California, New York and Michigan. Trend data is not available at every metropolitan district in the nation, due to privacy concerns. An area has to have a specific number of searches before Google will calculate a search intensity for that locale.

While our analysis only used certain key words we could expand the number of search terms to see if terms are used interchangeable for the same coin. For example, did individuals use the term "BTC" over "Bitcoin" while our analysis only captured those who used the term "Bitcoin". This would also assume a higher level of awareness or familiarity with a certain coin. For an individual to use the shorthand of the coin, they would have to be familiar with that coin a bit more than maybe just what they see in the news. While only Coinbase was used for this analysis, further work could expand on looking at other exchanges. Particularly, some newer coins may not be yet adopted onto Coinbase and so individuals searching for that coin may not even look at Coinbase and use another exchange. Other more mainstream exchanges such as Robinhood or SoFi were excluded from this analysis due to their foray into many other financial products. It would be very hard to disentangle whether someone was searching Robinhood for an exchange when most of their business comes from their more common stock focused brokerage platform.

5 References

Aziz, Tariq, and Valeed Ahmad Ansari. "How Does Google Search Affect the Stock Market? Evidence from Indian Companies." Vision 25.2 (2021): 224-232.

Brodeur, Abel, et al. "COVID-19, Lockdowns and Well-Being: Evidence from Google Trends." Journal of Public Economics, Elsevier, 2020, p. 104346, doi:10.1016/j.jpubeco.2020.104346.