



Data
Visualization
Manipulation:
Bitcoin

Jessica Reingold

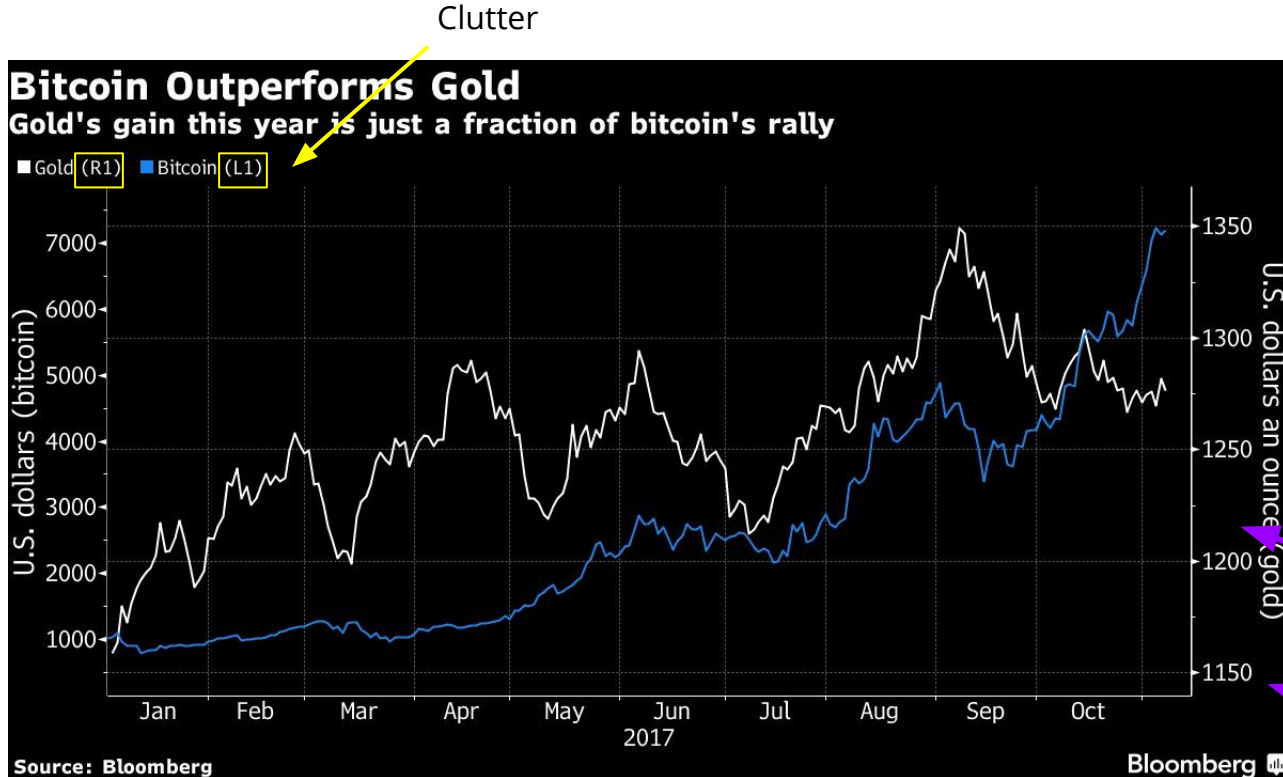


Bitcoin Line Graphs

The following graphs, while both line graphs have some serious manipulations, but also have poor design features. I believe they are conveying the point they want to make, but they are doing so in a misleading way. They are trying to show how much Bitcoin has grown and how it compares with other currencies, or currency standards, and stocks. Although they both have multiple issues, the ones that jump out are that one graph has confusing axis, and the other doesn't equally represent the data.

Bitcoin v. Gold

Legend outside graph



2nd Y-axis goes against mental models.

Uncommon increments

Y-axis doesn't start at 0

Source: [Bloomberg](#)

Bitcoin v. Gold Improved

*Note: Lines are not 100% accurate due to lack of raw data, but the increases and decreases are represented similarly to the original chart

One Y-axis and one standard to compare to



US Dollars (an ounce in Gold)

1400
1300
1200
1100
1000
0

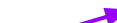
1 2 3 4 5 6 7 8 9 10

2017 (Months - Jan-Oct.)

Accessible increments



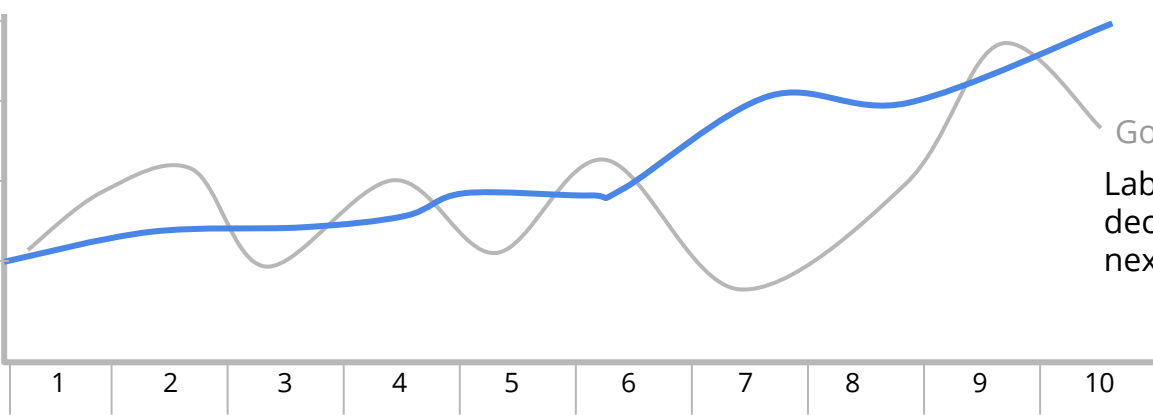
Y-axis starts at 0



Bitcoin

Gold

Labels decluttered and next to lines



More Objective Bitcoin v. Gold

Misleading Data Improvements:

One way to create misleading data is going against readers' mental models. Mental models what the readers have "learned over the course of [their] lives" (Few, 2013, pg. 60). Mental models are important to consider when designing charts because they will dictate how readers will initially see and interpret data. The vast majority of readers are used to see one y-axis and one x-axis on a chart. They read left to right and down to up to find the data points. On the Bloomberg line chart, there are two y-axes, and it is confusing to figure out how to read the chart and compare the two sets of comparative data. Instead of trying to parse out the differences and create two separate line charts to make the visualization easier to interpret, I chose to pick one y-axis and use it for the whole chart. I chose U.S. Dollars in gold because that plays to people's mental models of U.S. currency since it is older. In choosing one y-axis, I also cleaned up the numerical increments. I started the chart at a clear 0 and chose even simpler increments (Wong, 2010, pg. 53) - 1000s instead of 50s. When the gold standard y-axis didn't start at an obvious 0, it was misleading because it truncates the data (Wong, 2010, pg. 64).

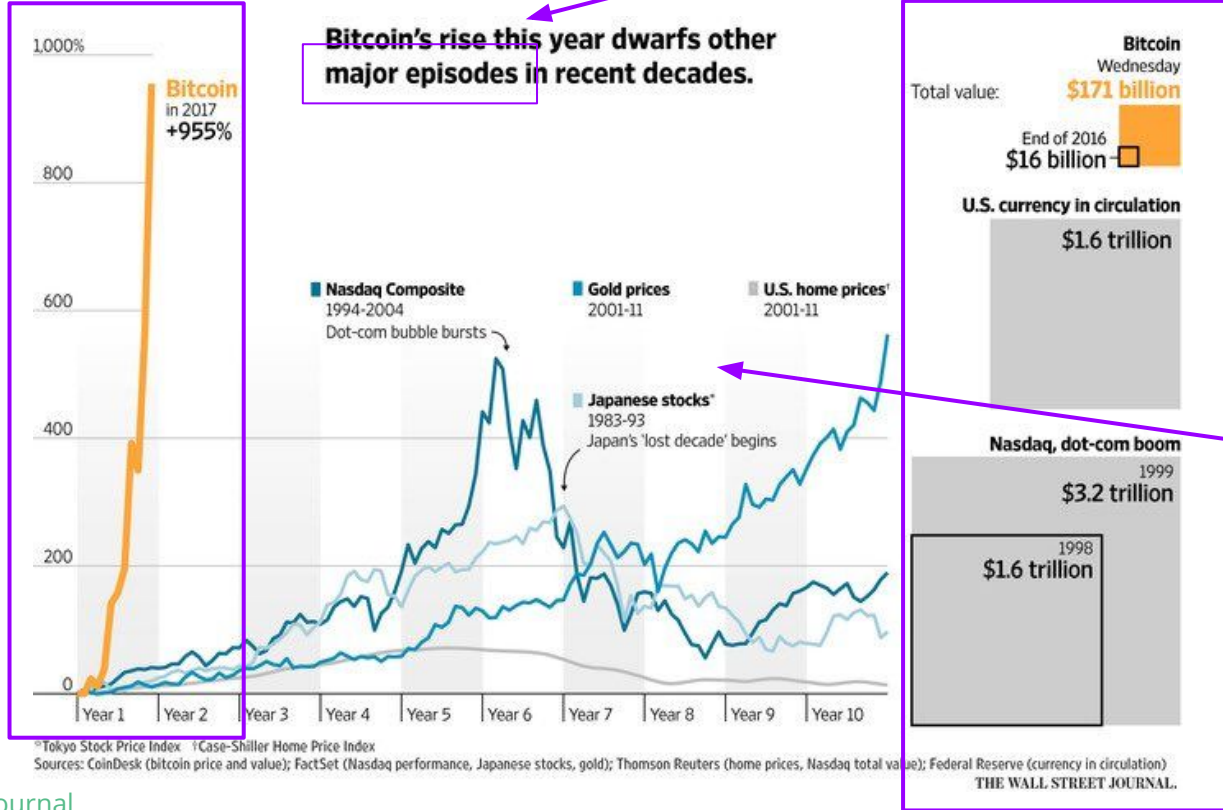
Additional Design Improvements:

I decluttered the chart by taking away excess information next to the legend items, moving the legend items next to their corresponding lines, which helps the reader to "identify the lines quickly" (Wong, 2010, pg. 57).

Bitcoin Ascent Annotated

Lack of context: What are the major episodes represented?

Context issue: Bitcoin has been around for more than a year



Supporting graphic?

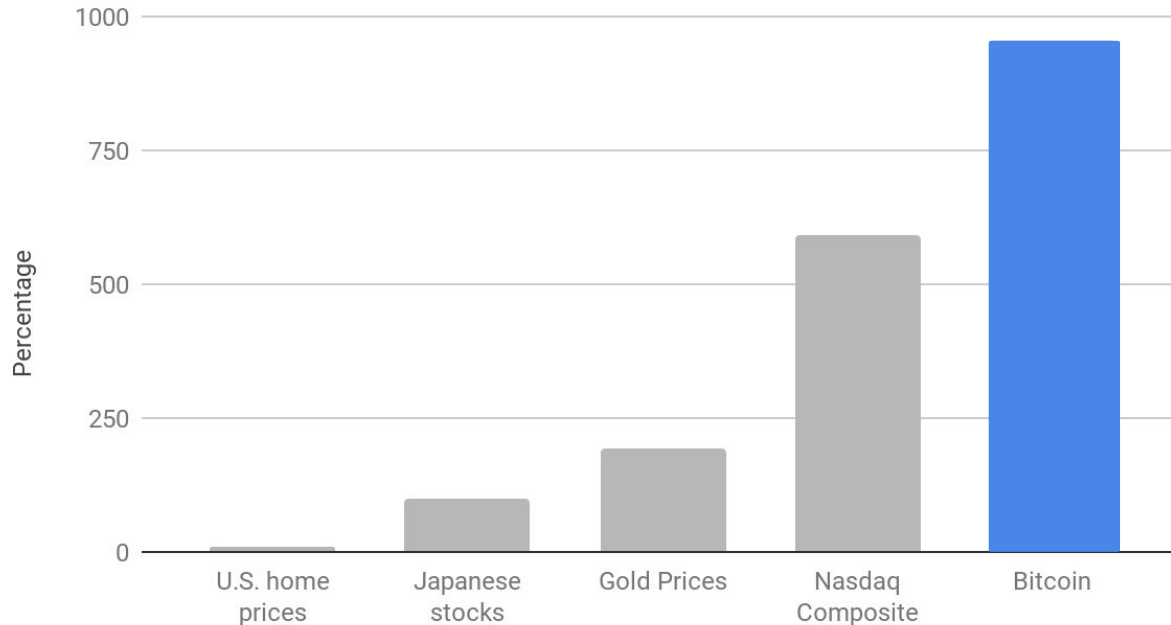
Labels in the graph but actually add clutter

Bitcoin Ascent Improved

*Note: Bars are not 100% accurate due to lack of raw data, but they very close estimates.

Bar graph better shows how the various currencies compare in their peaks so far

Highest Rate of Increase in Currency's Life Thus Far



Context all summed up in the title

Blue color highlights Bitcoin

More Objective Bitcoin Ascent

Misleading Data Improvements:

What I believe the line chart was trying to convey was that bitcoin rose extremely high and quickly compared to other forms of popular currency types. Those other types rise and fall over ten years, and Bitcoin surged in around one year (after being around for a few years). This is portrayed poorly in the chart. First, the secondary chart to the right, with the squares might be necessary but it's too difficult to decipher and connect with the line graph. Second, because the Bitcoin line is only in year 1, it makes it appear like it has only been around for one year, which is not true. It's been around for seven years, albeit being worth only \$0.06 in 2010 (Coindesk). To remedy the confusion and misleading portrayal of Bitcoin's rise, I changed the type of chart and way the data was being represented, while still maintaining the core message: that Bitcoin has risen to much higher from its original worth than other currency types. I chose a bar chart because it shows a simple nominal comparison between the rise percentages of the various currencies while also creating a visual distinctness between the quantitative values (Few, 2012, pg. 106). Nominal comparisons are easier to read (Few, 2012, pg. 105), which is ideal when trying to explain a subject that may be more complex for readers to understand.

To further show Bitcoin's significance in the chart, I highlighted Bitcoin's bar. Originally, Bitcoin's line was a bright orange that stood out against the greys and blues, but it was also off to the left side, (an odd way of highlighting it) because of the way the data was displayed. On the bar chart, the data is altogether, so I chose to give the Bitcoin bar a more saturated color, blue amongst the grey, to give a "visual cue" (Knafllic, 2015, pg. 42) that indicated its importance.

Sources

Coindesk. Bitcoin (USD) Price. Retrieved from <https://www.coindesk.com/price/>

Few, S. (2012). Show Me The Numbers, Designing Tables and Graphs That Enlighten. 2nd ed. Burlingame, CA: Analytics Press.

Few, S. (2013). Information Dashboard Design. 2nd ed. Burlingame, CA: Analytics Press.

Knaflic, C. (2015). Storytelling with Data. Hoboken, NJ: John Wiley & Sons Inc.

Rudegear, P. and Otani, A. (2017). Bitcoin Mania: Even Grandma Wants In on the Action. The Wall Street Journal. Retrieved from <https://www.wsj.com/articles/bitcoin-mania-even-grandma-wants-in-on-the-action-1511996653>

Van Der Walt, E. (2017) 'Buy Bitcoin' Overtakes 'Buy Gold' as Online Search Phrase. Bloomberg. Retrieved from <https://www.bloomberg.com/news/articles/2017-11-07/bitcoin-rally-is-eroding-gold-s-appeal-top-online-vaulter-says>

Wong, D. (2010). The Wall Street Journal Guide to Information Graphics. New York, NY: W. W. Norton & Company Inc.