

Economics 103 — Spring 2021

International Monetary Relations

Writing Assignment 2

Bitcoin

April 20, 2021

Due: **Fri, May 7, before 4:50pm**
Submit through Canvas under Turnitin

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This writing assignment asks you to use basic relationships from the course to assess the crypto-currency Bitcoin (BTC) and its valuation in U.S. dollars (USD). The assignment also asks you to critically assess the usefulness of those relationships for unconventional currencies.

Reading and Web Resources

Go to the website of the American Economic Association and the article “Bitcoin: Economics, Technology, and Governance” at <https://www.aeaweb.org/articles?id=10.1257/jep.29.2.213>. **Read** the article and make sure you understand the principles of Bitcoin. **Infer** how the supply of bitcoin evolves over time through “minting” and the “mining” of blocks in the blockchain.

One way to think about the valuation of a bitcoin in U.S. dollars is to assess its change in value over the past decade or so (bitcoin started to have meaningful value in early 2011). For this purpose, use the Relative Purchasing Power Parity condition and restate it in a way that relates the expected change in the nominal exchange rate of BTC (E in [USD/BTC]) to the rate of money growth of bitcoin ($\Delta M^B/M^B$), money demand for bitcoin ($\Delta L^B/L^B$), and the inflation rate of the U.S. CPI (π). Some of these quantities are quick to find. You can compute the change in the nominal exchange rate of BTC from <https://blockchain.info/charts/market-price?timespan=all>, the rate of money growth of bitcoin from <https://blockchain.info/charts/total-bitcoins?timespan=all>, and the U.S. inflation rate from <http://www.usinflationcalculator.com>. What can you infer about the change in demand for bitcoin?

Another way to think about the valuation of bitcoin in U.S. dollars is to estimate a plausible value. For this purpose, use the Quantity Theory of Money, which relates the supply of bitcoin M^B and the velocity of bitcoin v^B (say in 24h) to the price of a U.S. dollar in terms of bitcoin P^B (in [BTC/USD] so that $1/P^B = E$) and the volume of bitcoin transactions is Q^{USD} (in 24h). You can find bitcoins in circulation M^B at <https://blockchain.info/charts/total-bitcoins> and the Estimated Transaction Volume in USD Q^{USD} (over the past 24h) at <https://blockchain.info/stats>. You can compute the velocity of bitcoin v^B (over the past 24h) as the ratio of BTC sent in the last 24h at <https://bitinfocharts.com/bitcoin> (in BTC) and M^B (in BTC). What is your valuation of bitcoin in dollars $E = 1/P^B$?

Writing

Suppose you are writing to explain bitcoin valuation to a freshman at UC San Diego. Plan on writing four paragraphs with up to 500 words. 1) **Write** an opening paragraph that explains what bitcoin is, as a currency. 2) **Use** both valuation methods above, or if you like another method (related to course material) and online data, to **describe** either the change in the fundamental USD value of a bitcoin or your best estimate of a fair USD price of a bitcoin. Make sure to explain your reasoning. If you need more than two paragraphs to do so, write more than two paragraphs. 3) In a final paragraph critically **assess** the usefulness and limitations of the basic relationships from the course for the valuation of bitcoin.

References

Böhme, Rainer, Nicolas Christin, Benjamin Edelman, and Tyler Moore. 2015. "Bitcoin: Economics, Technology, and Governance." *Journal of Economic Perspectives*, 29(2): 213–38.