Criticality of Bitcoin Market
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F. Chudzyński[a,*] and Z. Struzik[a,b]

[a] *University of Warsaw, Krakowskie Przedmieście 26/28, 00-927 Warsaw, Poland*
[b] *The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan*

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This note aims to correct the error, which led to false conclusions presented in the contested article. The following sections are affected: 2.2 Activity periods, 3.3. Volume, 3.4. Bin size optimization, 4. Summary, and also Figs. 6 and 7.

1. Description of the error

The procedure of estimating the activity periods consisted of calculating the histograms for each day and then summing them up to obtain a histogram for the entire dataset. The loop used to sum the histograms was erroneously running for only the first three days. Since the volume is expressed as a percentage of the total transaction volume, the mistake went undetected.

2. Erroneous conclusions

As a consequence of the above error, the results presented in Figs. 6 and 7 were incorrect and the factual result is presented in the new figure (see attached Fig. 1).

As a reminder, the value on the y axis represents the maximum volume traded in a given slot. Consider, e.g., 4-hour slot — there are 20 slots of this length in a day (1–4, 2–5, etc.). For each day i in the dataset, we add the volume of transaction occurring in a given slot $V_{1-4} = v_{1-4}^{i} + v_{1-4}^{i+1} + \ldots$ and out of all V the maximal value is chosen, i.e., $\max(V_{1-4}, V_{2-5}, \ldots V_{20-24})$.

The main difference between the factual result and the previous erroneous result is that the volume of transactions increases almost linearly with the increase of the time slot, as opposed to the previously obtained erroneous results, where nearly all of the transactions occurred in 8-hour slots. Thus, the hypothesis that the convergence to Gaussian above $s \simeq 300$ is related to the fact that most of the transactions occur in this time range has to be rejected. It is still possible that the convergence is related to the activity on the market, but in a more complex way.
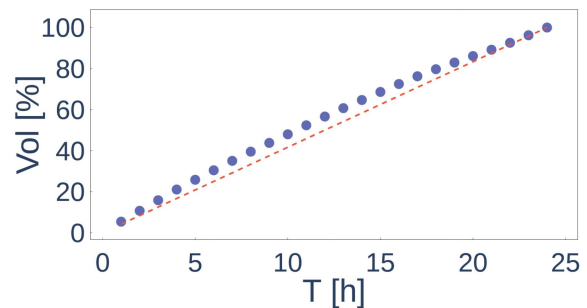

Fig. 1.   Maximum volume traded in each period T. Red dots represent linear growth, plotted for reference. As the time slot increases, the traded volume increases proportionally.