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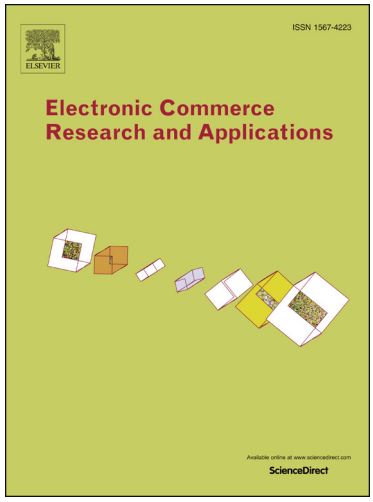

Digital blockchain networks appear to be following metcalfe's law

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DIGITAL BLOCKCHAIN NETWORKS APPEAR TO BE FOLLOWING METCALFE'S LAW

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ABSTRACT

An analysis of some of the recent blockchain networks is presented to determine if they satisfy Metcalfe's Law for networks, as has been shown online social media networks. The value of a payment network was modeled based on the price of the digital currency in use on the network, and the number of users by the number of unique addresses each day that engage in transactions on the network. The Bitcoin, Ethereum, and Dash networks were analyzed. The analysis shows that the networks were fairly well modeled by Metcalfe's Law, which identifies the value of a network as proportional to the number of its nodes, or the number of its end users. A new network model is also presented that shows the value to be proportional to the exponential of the root of the number of users participating in the network, and shows good agreement as well. Conditions for determining critical mass based on the new model are also presented. Finally, the potential for identifying value bubbles that can be spotted as deviations in value from the model is discussed and illustrated using the data from one of the networks. Those value bubbles show up where repeated extremely high value increases are not accompanied by any commensurate increase in the number of participating users, or any other development that could give rise to the higher level of value.

Keywords: Blockchain, cryptocurrency, digital networks, distributed ledger systems, distributed transaction processing, fintech, Metcalfe's Law, network effects, online payments, payment networks.

Brief bio of the author. Dr. Ken Alabi has a Ph.D. in Engineering from Stony Brook University and a Masters in Computer-Aided Engineering from the University of Strathclyde. He is a programmer and technology professional with over thirty publications in the fields of Engineering and Computer Science.

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