Chapter 42
A Call for Second-Generation Cryptocurrency Valuation Metrics

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ABSTRACT

This chapter builds on the body of work that has depicted cryptocurrency as a model for science and higher education funding. To that end, this work examines the degree to which one or more cryptocurrencies would need to be adopted and achieve a network effect prior to implementation of such a funding model. Empirical data from three different cryptocurrencies were examined. The current work deploys generalized autoregressive conditional heteroskedasticity (GARCH) to analyze stochastic volatility. This work contends that the examined coins are likely overdistributed and too volatile, thereby limiting the wealth generation possibilities for funding science or higher education. Additionally, based on the GARCH analysis, this work highlights that cryptocurrency pricing metrics and valuation models, to this point, may be insufficiently complex to persuade institutional investors to seriously allocate capital to this ecosphere.

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INTRODUCTION

The phenomenon of the underfunding of science research specifically, and of higher education more broadly, is a significant and pressing issue whose complexities require innovative approaches to begin to ameliorate the persistent diminishment of financial resources. Although science research and higher education funding are, admittedly, separate and fund specific fields with distinct practices and obstacles, this work investigates how an enacted two-sided network effect, in which additional users create additional value, could provide alternative portfolio diversification to fund both areas. By continuing previous work on portfolio modeling using cryptocurrency (Lehner, Hunzeker & Ziegler, 2017) and the conceptual framing of cryptocurrency-based funding (Lehner & Ziegler, Ch. 7, this volume), this work further examines the importance of an enacted two-sided market effect as it relates to the type of cryptocurrencies to effectively augment science research and higher education funding. More specifically, we employ cryptocurrency data to examine the degree to which three different currencies have achieved a network effect and whether these currencies could serve as viable academic funding streams.

We elucidate this position in seven distinct sections: 1) science research and higher education funding as a human right and subsequent alignment with budgetary realities; 2) cryptocurrency as wealth generator, enacting disruption of science research and higher education funding; 3) examination of cryptocurrency volatility and pricing metrics; 4) specific examination of Bitcoin, Dash, and PIVX; 5) and limitations, directions for future research, and conclusions.

RECLAIMING SCIENCE RESEARCH AND HIGHER EDUCATION AS PUBLIC GOODS AND HUMAN RIGHTS

Worldwide, the funding of science research and higher education is closely intertwined with politics, an interrelationship that produces undesirable influences that might be mitigated by alternative funding sources. Lehner et al. (2017) argued that in the U.S., for instance, scientific research currently models a version of private equity investment, as various stakeholders compete for the intellectual property that government- and corporate-sponsored research produces. Consequently, researchers must always consider how best to position external stakeholders as they pursue work internally. The results of their research are likely to be published in the walled gardens of commercially controlled academic journals (Lehner & Finley, 2016), all while under the constant threat of diminished funding and other resources. This work centers on alternative funding; however, its fundamental underpinnings also closely align with the argument that science and higher education are fundamental human rights and that the primary purpose of both is to benefit the public.

University funding for scientific research is tied to a host of implicit and often underexplored corporate factors in complicated ways. Chomsky (2011) noted that scientific researchers find themselves at a troubling impasse, with austerity measures and conservative politics at one end of the spectrum and the need to advance scientific inquiry for societal benefit on the other.

To again take the U.S. as an example of wider trends, Aud et al. (2010) noted, in their report for the National Center for Education Statistics, that federal funding for higher education is declining, despite a growing number of student loans. In addition, the Pew Trusts (2015) underscored that federal funding for higher education has consistently declined during a decade of economic growth. Echoing the complex negotiations inherent in the funding of science, U.S. higher education, as reported by the Pew Trusts