

The Blockchain Alternative

Rethinking Macroeconomic Policy
and Economic Theory



Kariappa Bheemaiah

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*In remembrance of Professor Nigel F.B. Allington.
A teacher, mentor and friend who taught me how to learn.*

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About the Author



Kariappa Bheemaiah, or **Kary** to his friends and colleagues, is a researcher, visiting lecturer, and technology consultant based in Paris. His articles and interviews on the Blockchain and the effects of technological change on society have been published in *Harvard Business Review*, *WIRED* magazine and *Les Echos*, amongst others. He is also a public speaker and gave his first TEDx Talk, “The evolution of currency,” in 2014. He will be giving his second TEDx Talk, “Rethinking Capitalism with the Blockchain,” in May 2017.

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About the Technical Reviewer



Dr. Garrick Hileman is a senior research associate at the Cambridge Center for Alternative Finance and a researcher at the Center for Macroeconomics. He was recently ranked as one of the 100 most influential economists in the UK and Ireland and he is regularly asked to share his research and perspective with the *FT*, BBC, CNBC, *WSJ*, *Sky News*, and other media. Garrick has been invited to present his research on monetary and financial innovation to government organizations, including central banks and war colleges, as well as private firms such as Visa, Black Rock, and UBS. Garrick has 20 years' private sector experience with both startups and established companies such as Visa, Lloyd's of London, Bank of America, The Home Depot, and Allianz. Garrick's technology experience includes co-founding a San Francisco-based tech

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Introduction

Infiltration was the name of the game in 2015. Indeed, both emotionally and economically, it was an extraordinary year. While the world horrifically responded to the spate of terrorist attacks within their own borders, such as in Paris and other parts of the globe, the world of finance bore witness to a new kind of infiltration within its own borders. The Blockchain, which up until then was a technology only being discussed on the fringes of the financial world, was suddenly on the tips of the tongues of investors, VCs, bankers, and governments.

From its relatively modest beginnings seven years ago in an obscure white paper, the technology was now in full bloom and one could hardly pick up a newspaper or a magazine without some mention of it. As questions began to be asked, a slew of blogs and amateur documentaries became available online, with even the BBC joining the ranks.¹ But if 2014 was the year of bitcoin documentaries, 2015 was the year of Blockchain conferences. Talks, round tables, and seminars abounded all over the world, with keynotes being given by bankers, politicians, academics, investors, coders, and technologists. As 2016 rolls out, it is definitely becoming the year of books on the Blockchain, with over 15 books and counting having been published on the subject this year alone.² It would be safe to say that the technology is becoming mainstream, which is a pleasure for people like me who have been following the subject for a few years.

So why another book on the subject? The answer to this question lies in scope, scale, and objective. While most of the brilliant works which have been published in the past year address a number of key issues, the conversation still does not allow most of us to gauge the gamut of this technology's impact. Previous and more recent works regarding the Blockchain have looked at the applications of this technology in terms of sectorial transitions. However, there seems to be a lack of insight geared towards the implications of this technology.

To be able to ascertain what the future implications could be requires that we not only understand the Blockchain, but also the other technologies and theories that are currently changing the way finance and economics is defined. Hence, this book is not just about the Blockchain. It is a review of the past and current ideas, policies, and technologies that are challenging and changing the functionality of the complex dynamical system of modern-day capitalism.

¹The documentary was made available on BBC's iPlayer on 5 Dec 2015.

²This list consists of books with the word "Blockchain" in the title, made available on Amazon in 2016.

Naturally, as changes occur, it leads to a number of questions. But with the blockchain, the questions are intimately profound in nature, for as the technology begins to be adopted by commercial banks and financial institutions, the questions that need to be asked are with respect to, what does this mean to the rest of society? Will this technology provide us with greater transparency, democracy, and savings? Can it be used to create a better version of capitalism? And if so, then how?

The primary aim of this book is not just an attempt to provide answers to some of these questions, but also to rotate the direction of the current conversation being had in various circles in order to encourage a deeper level of thinking with respect to the technology and its uses. To do so necessitates a return to the fundamental beginnings of currency and the concept of money. Hence, the first part of the book deals not with the Blockchain, but with the mechanics of how money and debt is created. We begin by understanding how fractional banking, the current system used in the production of money, works and thus gain some insights into the operating system of monetary economics. This gives the reader a clear view of how debt and the financialization of assets are leveraged by the financial system to create the bedrock of modern capitalism. Without a sufficient understanding of these topics, there is no context for the conversation.

The second part of this book delves into the blockchain from the perspective of its transitional role in finance. Following the financial crisis of 2008, the financial sector has been in a state of flux. On one side, governments and regulators now demand a greater level of transparency with respect to financial innovation, taxation, and cross-border transactions. On the other hand, technological progress is defragmenting the financial sector, causing incumbents to be challenged by tech firms. While the current dialogue looks at the blockchain as an independent technology, this section of the book attempts to clarify its amalgamator function when juxtaposed with other technologies that are currently fragmenting the sector of finance. By looking at the Blockchain as a tool that can leverage the advances being made in other disciplines of finance, now popularly cited as Fintech, it allows us to gain a more holistic viewpoint of the role of this technology.

Having gained an understanding of how finance is being fragmented in the context of technology, debt and money creation, the third part of this book attempts to determine what the implications of these paradigmatic shifts mean to societal monetary systems. While the reasons for the changes being seen in the sector of finance are often looked upon as independent fluctuations, they are in fact interrelated, and the precipitate of this interaction begets a need for a new definition of economics. This section attempts to articulate that definition by offering the reader an understanding of how different technologies, including the Blockchain, are transforming the sector of finance and creating a new paradigm of capitalism.

The third and fourth parts of the book look at the impact of this technology from a more macroeconomic level. After a brief discussion on monetary and fiscal policy, a review of the possible implications to central banking is made. We will also analyze what the consequences of multiple currencies, decentralized ledgers, and cryptographic control systems means to central banking. This sets the stage for what measures, tools, and theories need to be understood in order to create a new framework of monetary economics. It is here that the reader will also be introduced to the concept and the emergence of a cashless economy. Apart from describing the implications of a cashless system in terms of controlling excessive debt and economic pollution, the reader is also introduced to what new branches of science will help us gauge and govern this system.

While the subject of economics is old, the methods being used to understand these multifaceted ecosystems do not pay homage to the intricacy that results from its intertwined lattice structure. What is required in today's data-rich environment is an approach that allows us to have greater mathematical exactitude and a higher probability of identifying systemic risk than current economic models. As the world increasingly becomes digital in nature, there is a burgeoning need for a new way of observing and measuring economic systems. Not only are our techniques outdated, but so are the theories on which they are based.

Hence, the final section begins with an assessment on how current theories and techniques lack in addressing these conditions and offers the reader an introduction to the new principles being discovered, debated and tested. Reference to topics such as econophysics, adaptive markets hypothesis, complexity economics and super forecasting³ will be made and the reader can expect to find reasoning statements that make the case for adopting these new theories and tools.

Having described the past and present interpretation of events, the section ends by attempting to connect the dots in order to show how the technologically powered defragmentation of the financial sector can lead to the creation of a new and less indebted system of fractional banking. It also investigates if these changes could offer sovereign states a new way to produce money and looks at alternatives other than inflation and interest rates to govern monetary policy. Finally, it reviews different scenarios of how this new structure can be used to implement innovative policies, such as overt money finance and universal basic income, which could help address issues such as income inequality and technological unemployment that currently threaten most economies.

While the purpose of the book is to shed more light on the implications of the widespread use of Blockchain technology, the growing diversity within the currency space cannot be fully excluded from the discussion. As the blockchain gains more traction in formal financial circles, its first manifestation in the form of Bitcoin is increasingly being excluded from the dialogue. This seems to be contrary to the symbiotic link between the two. What is more surprising is the fact that this tendency to separate bitcoin from blockchain is a repeat of what happened when the Internet first came into existence. As banks try to harness the power of the blockchain by creating private blockchains, we find ourselves witnessing the same execution of events as when private companies tried to create intranets instead of simply using the Internet.

Whether you are a fan of the bitcoin or the blockchain or both, having a nuanced or biased view on the subject needs to be developed using the scientific method. This is a new technology that has been in existence for less than a decade. But what it represents is a change in our perception of trust along with a change in the organization of authority from traditional hierarchical systems to network-centric flat systems. It allows us to redefine how money and currency derive their actual value and forces us to think about the rebalancing of power on a global socioeconomic scale.

This book aims to address these issues to a certain extent, being limited only by the author's own knowledge and experience. It does not attempt, by any means, to settle the dispute between bitcoin and the blockchain and the ongoing rift that is being created between the two. That, by itself, is a subject for another book. But by looking at

³A term borrowed from Philip Tetlock and Dan Gardner's new book of the same title.

the macroeconomic uses and potential impacts of this technology, it is the objective of this book to initiate a much-needed conversation on how this technology can be utilized to create a more sustainable and sensible economic system that can be deployed in the current socioeconomic ambience at a rate at which it can be absorbed.

As a growing number of academics from various disciplines begin to ponder similar issues, it is also the purpose of this book to give the reader a synopsis of the advances being made in this field of study. Anyone who attempts to cover a project of merging all these subjects and developments could only do so by conducting extensive research on the works of a plethora of researchers, academics, and policy makers who are rethinking these subjects in a variety of disciplines. Thus, although the author aims to provide the reader with a fresh perspective, this new portrayal of capitalism is the result of those minds who are currently battling with the existing state of affairs, and without whose efforts, this book would not exist. In this respect, the book might seem like an extended academic report from time to time, as it incorporates the works of a number of extraordinary new thinkers. Any inescapable criticisms faced by the author's mapmaking efforts are his own responsibility.

Prior to engaging with this book, it must be remembered that the Blockchain is not meant to be looked at as an answer to all our economic woes. There are a number of other technologies which are also currently transforming the subject of finance and economics. But as technology has the tendency to feed off technology, the Blockchain's role as an infrastructure technology allows it to be united with other technologies and hence amplify their effects. Thus, a final objective of this book is to clear the haze created by the barrage of information in today's digital world in order to allow readers to connect the dots themselves and witness the convergence of technology. Most importantly, it attempts to determine how the Blockchain could be used to find an antidote to our debt-addicted monetary system.

What this technology offers us is a front-row seat to witnessing history in the making and a possible memory of the future. After all, history is not just the past, but also the way we change the present to affect the future.