Preface

IN WHICH WE DENY BEING SATOSHI NAKAMOTO . . .

This is a book about the outlines of a new discovery in economics, namely of the economic significance of a particular new technology: blockchain, or distributed ledger technology. Now, in physics or biology, when you make a discovery you reveal something that was there all along, say a law of nature describing the melting point of some substance, or the existence of a new species of tree frog. You did not invent a new tree frog. Technology discoveries, on the other hand, are inventions, and we owe these to engineers and entrepreneurs, tinkerers and professionals alike. But the subject of this book is a discovery about an invention.

This requires some nuance because, clearly, we ourselves did not discover this technology; that was done by those who invented it, including the mysterious Satoshi Nakamoto, who figured out how to apply the 'proof of work' mechanism to solve the double-spending problem, thereby inventing Bitcoin, the world's first cryptocurrency. Moreover, Nakamoto and others did not just randomly stumble upon this. They intuitively understood its potential economic value. We neither invented this technology, nor discovered its economic value. All of that was already done long before we came along.

What we do here is something different: we claim to have discovered why blockchain is economically significant (that is, significant to economists), which indeed suggests a new type of economics: what we call institutional cryptoeconomics. This is a book about a new discovery about how economies work, and the institutional technologies that facilitate contracting and economic cooperation. We argue that blockchain is the lens that reveals this discovery of the economic significance of this institutional technology.

IN WHICH WE COMPARE OURSELVES TO ADAM SMITH . . .

This is often what discovery looks like in economics. When Adam Smith 'discovered' the significance of markets (the genesis of modern economics), he did so through the lens of a new 'institutional technology' that he had

observed in its nascent local phase, and intuited its broader significance and implications, namely the factory. Factories organise the division of labour, which is limited by the extent of the market. Karl Marx did not invent financial capital, Alfred Marshall did not invent industrial districts, and Alfred Chandler did not invent the M-form corporation; but they did discover the economic significance of these new institutional technologies.

Blockchain is a new technology, one of among a vast number of new technologies invented in the past decade or so. Some of these will become economically important, in the sense of creating new sources of value, and we certainly think cryptocurrencies and blockchain will be among that set. But our argument in this book – our claim to discovery – is not that blockchain technology will be economically important as a new technological trajectory, like a new gene-editing technology or nano-material, say. Rather, our argument is that blockchain is a new institutional technology – an argument first outlined in a paper with Primavera de Filippi – that will change how economies work.[1]

Now blockchains are still very much an experimental technology, mostly in the proof-of-concept phase of research and development – just like factories were when Adam Smith wrote the *Wealth of Nations*. 'But Professor Smith', his colleagues could fairly have said, 'all I see about me are small farms and muddy roads. Your "pin-factory" theory only seems to apply to a tiny and newish part of the economy.' But Smith saw how this new institutional technology would shape the way economies grew and developed.

We are not alone in seeing the economic significance of blockchain. A growing number of economists have in the past few years become fascinated by this new technology; see, for instance, the new sessions on cryptocurrencies at scholarly meetings such as the American Economic Association, and the explosion of papers and special issues on the subject. But the novelty of what we are doing in this book is to seek to organise this insight into the beginnings of a whole new research programme on how this new institutional technology will affect how economies work.

Adam Smith did not live to see how the factory system would create industrialisation and vast growth in prosperity. That did not happen for decades after he wrote in his own part of the world, and indeed took centuries in other parts of the world. The blockchain-based transformations we describe here may not have their full effect until some time in the future.

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[1] Sinclair Davidson, Primavera de Filippi, and Jason Potts, 'Blockchains and the economic institutions of capitalism', *Journal of Institutional Economics* 14, no. 4 (2018).

IN WHICH WE CLAIM TO BE ABLE TO SEE THE FUTURE . . .

Nevertheless, what can be seen right now, what we describe in this book, is the economic logic of how and why this will play out. To be utterly clear: we do not have deep expertise in cryptography or database engineering. Rather, our claim to be able to see the future of economies through the lens of blockchain as an institutional technology is owed to our combination of perspectives.

We each came at this from somewhat different directions: Chris Berg as a political economist interested in the history of regulation; Sinclair Davidson as a public finance economist interested in financial platforms and governance; and Jason Potts as an evolutionary economist interested in early stage technologies. We shared a common research focus on the institutional evolution of economies, and a belief that the Hayek–Buchanan–Williamson–Ostrom nexus was the key to understanding how the adoption of blockchain technology will change how economies work.

IN WHICH WE WONDER WHERE EVERYBODY ELSE IS . . .

Scholarly biographies of many of the great economists of the twentieth century often point to the searing experience of the Great Depression of the 1930s as driving a deep and passionate interest in understanding its nature and causes (giving rise to macroeconomics, welfare economics and development economics), pulling young scholars from other fields (especially engineering) into economics. We think that blockchain technologies are a similar type of attractor, pulling in those interested in the technology of how communities create economic institutions, amidst epochal failures of global finance, nationalist economic control, and growing mistrust of public institutions.

Cryptocurrencies have probably driven more interest in the history and theory of money (cryptocurrencies as a private monetary technology) and the economics of governance (a.k.a. cryptoeconomics) than any other thing. We are in the midst of a great revised interest in economics, not as a way to control economies (coded in law and regulation, and enacted through politics), but rather out of a new passion to know how to code them and build them (coded in software and enacted through platform engineering). Blockchains come out of cryptography and software and database engineering, but they are fundamentally based on economic

incentives. To build and apply blockchains, it turns out, you need to understand how economies work and how to design economic mechanisms.

Specifically, blockchain technologies have revealed how incomplete our understanding of economics is, especially when it comes to not just the technologies of money (cryptocurrencies), but also to the manufacture of trust in the context of contracting under uncertainty (smart contracts and technologies of governance). The invention of blockchain reveals that the cost of trust is endogenous to the institutional technology, and that new institutional technologies will change the basic economics of organisation. That insight was always there to be had, and some New Institutional Economists such as Oliver Williamson had certainly seen it in abstract, but it took the arrival of blockchain technology to reveal it.

Broadly considered, this book is about the economic consequences of new institutional technologies of trust and the production of consensus about economic facts. Before blockchain, neither of these were frontier research topics in economics. This insight about the nature of institutional technologies opens whole new vistas on how economies work, including on economic history. This points to a new interdisciplinary research program me that will enable us to better understand the connections between economics and contiguous disciplines in political theory, law, accounting, communications and internet studies, sociology, anthropology, archaeology, and cultural science, among other fields. We see this as an enormously generative research programme. While we do not explore all those avenues in this book, we have indicated some in essays on *Medium* and in working papers on SSRN.[2]

IN WHICH WE THANK OUR SUPPORTIVE FRIENDS, HOPING THAT OTHERS WILL SOON JOIN US . . .

This book is a product of the RMIT Blockchain Innovation Hub, founded in late 2017 as the world's first social science research institute on blockchain. The idea for the Hub began around 2015, when a research team (supported by the School of Economics, Finance and Marketing at RMIT University and by Australian Research Council grant FT120100509) was looking into how people figure out entrepreneurial opportunities in very early stage technologies, including 3D printing, extreme sports, drones, and blockchain. Our hypothesis was that this happens in an 'innovation commons', which is to say that we were particularly looking for governance

[2] See, for example, Chris Berg, Sinclair Davidson, and Jason Potts, 'The blockchain economy: a beginner's guide to institutional cryptoeconomics', *Medium*, 2017.

institutions.[3] The moment of discovery for us was when we realised that one of these nascent new technologies (blockchain) was itself a radical new governance institution. At that moment we dropped everything, and went down the rabbit hole, as so many others have in the cryptocurrency and blockchain space.

We were extremely fortunate in our vision for a new interdisciplinary research programme to find ourselves at RMIT University with the bold and unwavering support of Calum Drummond, Ian Palmer, Geoff Stokes, and Tim Fry, who made it possible. It really could not have happened anywhere else.

The ideas that we have assembled and synthesised in this book are not ours alone, but come from a community of scholars and thinkers who we are honoured to call friends and colleagues: Darcy Allen, Mikayla Novak, Brendan Markey-Towler, Trent MacDonald, Aaron Lane, Alastair Berg, Ana Poscheneva, Jana Schmitz, Megan Kelleher, Nicola Narayan, Ellie Rennie, Julian Thomas, Marta Poblet, Asha Rao, Oleksii Konashevych; as well as Vijay Mohan, Prateek Goorha, Joseph Clark, Duncan Law, Stuart Thomas, Ashton de Silva, Senator Jane Hume, James Caton, Primavera de Filippi, Pip Ryan, Dax Zheng, and Stuart Eaton (Worldwide Blockchain Innovation Association), Nick Giurietto (Australian Digital Commerce Association), Bill Tulloh, Mark Miller, and Kate Sills (Agoric), and many others.

One of the ideas we develop in this book is a conception of the theory of 'high-trust economics', noting that for the most part we actually live in a relatively low-trust economic world, but that we also by and large had not noticed that, because historically it has always been true. The analogy is with high-energy physics, discovered in a mostly low-energy world, but key to building future technologies. Blockchain technologies transition us to a high-trust economy, and what is interesting is not just what that does to economies, but what it will do to cultures, societies, communities, and politics, as well as new technologies, that are built on such new economic infrastructure. We hope that this book will contribute toward nudging us all toward that future.

Chris Berg, Sinclair Davidson, and Jason Potts
Melbourne, February 2019

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[3] Jason Potts, *Innovation Commons: The Origin of Economic Growth* (Oxford University Press, forthcoming).