Blockchain will kill the traditional firm

Written by

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Published

16 October 2017

Category

Finance

Key topics

Cryptocurrency, Finance, Investment

Whereas previous generations of technology delivered the same objectives faster, blockchain has the potential to entirely change how businesses function

Blockchain and associated ‘initial coin offerings’ (ICO) are receiving increasing attention from companies, governments, venture capitalists and developers alike. Often viewed as a radical new technology that can redefine everything from financing for entrepreneurs to management of supply chains, blockchain has attracted as many supporters as sceptics. But little real economic work has yet been done on blockchain – so in this article, I’m going to discuss two main economic implications that myself and my colleague Dr Zeynep Gurguc have been investigating deeply: 1) the impact of blockchain on the boundaries of the firm, and 2) the impact on entrepreneurial finance through ICOs.

We may best view blockchain as the continuation of a process of digitalisation within the global economy that has been ongoing since the 1960s. While previous digital technologies have been applied to improve business processes, they have generally been aimed at delivering the same objectives faster, e.g. the digitalising of back

office services. As RH Coase put it in 1937, “innovations such as the telephone and telegraph, which tend to bring the factors of production nearer together, by lessening spatial distribution, tend to increase the size of the firm”. Previous generations of technology were therefore about the *faster* and *more secure* exchange of information. It is without doubt that digital technologies have in many cases enabled the ‘hollowing out’ of the firm, but continued the increasing reach of multinational organisations at lower costs.

> The most efficient boundary of the firm is shifting

Blockchain, meanwhile, is about the exchange of *value*; it is intended to enable individuals to exchange currency and other assets with one another without relying on a third party to manage the contracts and transactions. Many people discuss blockchain from the perspective of ‘removing intermediaries’, citing examples such as Bitcoin, which removes the need for central banks and shows trust in a currency can instead be created through a distributed network of nodes. Transactions are ‘trusted’ by the implementation of radical transparency: every transaction is publicly verifiable, and protected by cryptography and the solving of complex mathematical problems.

Newer implementations of blockchain such as Ethereum and Hyperledger offer companies and individuals the ability to create ‘contracts’ with one another, in principle reducing transaction costs and enabling a multitude of new business models to be created rapidly and in some cases dynamically or on the fly. Most importantly, these contracts can be established between individual creators and workers – not just large companies.

> In the US, VC financing is dominated by three main cities: Boston, New York and San Francisco

Blockchain presents us with something a little different from previous generations of technology therefore: the opportunity for entrepreneurs to work as individuals and coordinate economic exchanges of work and currency with one another in even large scale projects rather than needing the boundary of a ‘firm’ at all. Entrepreneurial activity could be orchestrated via a blockchain through removing the complexity of multiple contract negotiations.

It is our belief that today's economists may soon find themselves in the same situation as DH Robertson, Ronald Coase and Mrs Robinson: trying to ascertain how coordination activities are occurring in an emerging digital economy and carefully assessing how the "lumps of butter form in the milk" around blockchain-enabled services. As a result, we must constantly return to Mrs Robinson's questions: 1) are our theories tractable, and 2) are they reflected in the real world?

While blockchain does not itself challenge the theories of transaction costs or the boundaries of the firm, we can certainly see the way the real world is managing them because of blockchain is under rapid change. The most efficient boundary of the firm is shifting and we may enter a period where the price mechanism can be handled cost efficiently at the level of the individual, rather than the level of the firm. This undoubtedly has an impact on when, how and why a government would regulate certain activities an area our group is working extensively on. We are already seeing governments struggling to respond to ICOs despite them already having a large impact on entrepreneurial financing.

What is an ICO?

An ICO is an unregulated means by which funds can be raised for a new venture. They have so far been used by startups to bypass the regulated capital-raising process required by venture capitalists or banks.

Effectively, a percentage of a new cryptocurrency is 'sold' to early backers of the project in exchange for legal tender or other cryptocurrencies (e.g. Bitcoin). Examples include using an ICO to manage and control the interactions around transportation, providing decentralised telecommunications networks, or management of solar energy. The early backers receive a 'token' that can be used either for delivery in services, or in some cases can be used as a 'stake' in the company.

ICOs are therefore attempting to redefine how individuals and companies develop and attract funding streams, with many people claiming it is a more egalitarian approach to venture capital finance. In the US, for example, VC financing is dominated by three main cities: Boston, New York and San Francisco. Funding is directed by groups of people who are usually white, middle aged men from a certain class of society – or "pale, male and stale". Reports abound of women and people from minorities being excluded from receiving venture capital, exposing what could

possibly be a selection bias.

Can ICOs therefore allow a more efficient distribution of resources through our society? There are two aspects to this: first, the distribution of entrepreneurial finance; and second, how tokens redistribute access to physical resources in the world.

> Blockchain presents us with something a little different from previous generations of technology

First, blockchain and ICOs may help us with the selection bias applied by VCs; allowing people and ideas to be funded that would otherwise be left by the wayside. Similarities may be seen in the crowdfunding model, but ICOs permit direct access to working capital for those seeking funding. Governments, however, have started to regulate that ICOs that fail the Howey test must be regulated as securities. This leaves many in a complex situation: it means the tokens need to be treated mainly as ‘use tokens’, i.e. a unit of payment for a service that the ICO provides.

We may therefore be better viewing tokens and some ICOs as the redistribution of access to physical resources in a distributed manner. This, however, requires deep analysis of not just the technical protocols involved – which is what many start-ups are currently doing – but to also assess the impacts and delivery from an economic perspective. Happily, this is something my team are doing. In collaboration with Outlier Ventures, we are conducting a series of economic experiments that feed directly into token and protocol development. The result will be highly innovative and – most importantly – economically sustainable solutions to the challenges created by initial coin offerings.

This article was updated on 9 May 2024 to replace a pull quote with the subheading "What is an ICO?".

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About Catherine Mulligan

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Dr Catherine Mulligan is a Visiting Researcher at the Imperial College Centre for Cryptocurrency Research, having previously been a Research Fellow at the Business School. She is a member of the United Nations Secretary General's High-Level Panel on Digital Cooperation, as well as a Fellow and an Expert of the World Economic Forum for Blockchain Technologies.

Catherine has a PhD and an MPhil in Engineering for Sustainable Development, both from the University of Cambridge and a BSc. (Hons 1) in Business Information Technology from the University of New South Wales, Australia.

Catherine has published several books, with topics ranging from mobile technologies to the evolution of innovation within the communications industries from 1960 through 2010.

She has held £5.1 million of grants, including a number of EPSRC grants, including as PI of Scaling the Rural Enterprise.

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