

# Entrepreneurial Exit: Developing the Cryptoeconomy

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**Abstract:** Blockchain technology enables entrepreneurs to develop new decentralised governance structures to coordinate human interaction and exchange. That is, blockchain enables exit from political-socioeconomic systems through new forms of property rights protection and enforcement. This chapter examines the economic problem facing entrepreneurs as they use blockchain to *cryptosecede* and develop the new governance structures of the *cryptoeconomy*. The analysis draws on institutional and new development economics, arguing that blockchain entrepreneurs face a private economic development problem over complementary ‘protective-tier’ institutional technologies (Leeson and Boettke 2009). This understanding of the parallels between territorial economic development and the cryptoeconomy development helps explain collaboration between blockchain entrepreneurs within governance structures such as hackathons and conferences (Allen 2017). These collaborative governance structures are entrepreneurial efforts of self-governed economic development of the cryptoeconomy.

**Keywords:** Cryptoeconomics, Blockchain, New Development Economics, Institutional Entrepreneurship

## 1. Institutional blockchain entrepreneurship

Blockchain technology enables entrepreneurs to develop new decentralised governance structures for interaction and exchange (e.g. see Atzori 2015; Swan 2015; Wright and De Filippi 2015).<sup>2</sup> The new governance structures that blockchain entrepreneurs create are considered comparatively decentralised because they tend to push the governance of information—that is, the governance of ledgers (Berg et

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al. 2018)—towards networks rather than hierarchies. As an institutional technology, blockchain applications shift the boundaries of firms, markets and states, thereby reordering social, political and economic activities (Davidson et al. 2016). As an institutional technology, blockchain applications are not constrained to existing political-socioeconomic systems, but can be used as a governance tool to *exit* or *cryptosecede* from those systems, creating new decentralised governance structures (MacDonald 2015; MacDonald et al. 2016).<sup>3</sup> That is, cryptosecession involves entrepreneurs creating new decentralised governance structures that compete with firms, markets and states as comparatively effective structures of organisation. The various applications of blockchain through cryptosecession form the *cryptoeconomy*: a non-territorial collection of governance structures and exchange where interaction is primarily governed through blockchain technology, as compared to firms or governments (Allen 2017). Before individuals can exit to the cryptoeconomy, however, the governance structures—those institutions that protect property rights and enforce contracts—must be entrepreneurially discovered. Entrepreneurial discovery must *precede* exit and cryptosecession.<sup>4</sup> The evolutionary institutional political economy process of blockchain described in Markey-Towler (2018) rests on top of an entrepreneurial discovery process with similarities to the development of territorial nation states.<sup>5</sup> This chapter explores this entrepreneurial development problem through the lens of development economics (Boettke et al. 2008; Coyne and Boettke 2006; Leeson and Boettke 2009), providing insight into the entrepreneurial challenges facing the development of the cryptoeconomy.

In new development economics, Leeson and Boettke (2009) define two-tiers of entrepreneurship necessary for economic development:

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<sup>3</sup> Exit in the sense of Hirschman (1970), where individuals have three options to exert power over institutions: exit, voice or loyalty.

<sup>4</sup> This can be viewed within the literature on institutional change (e.g. Denzau and North 1994) and the evolutionary theory of institutions (e.g. Potts 2000).

<sup>5</sup> Note that the process of institutional evolution within the cryptoeconomy emerges in many ways, including through forking of existing blockchain institutions—that is, deciding to keep some institutions while removing others (Berg and Berg 2017)

productive technologies necessary to better support human needs ('productive-tier' entrepreneurship); and institutional governance structures necessary to secure property rights and trade ('protective-tier' entrepreneurship). This analysis is unique and useful because conventional emphasis of entrepreneurship takes the institutional environment as given, constraining entrepreneurs to 'productive-tier' entrepreneurship. In this view, entrepreneurial calculation is shaped by the costs of existing institutions (e.g. Baumol 1990). By contrast, the study of institutional entrepreneurship—what Leeson and Boettke call protective-tier entrepreneurship—recognises that the institutional environment must itself be discovered. Here, entrepreneurs undertake protective-tier discovery to solve a higher-order constitutional-level problem (see Kuchař 2016) of developing institutions that enable trade and exchange through the protection of property rights and the settling of disputes (Boettke and Coyne 2009; Leca et al. 2008; Leeson and Boettke 2009).<sup>6</sup> Together, the evolutionary process of productive-tier and protective-tier entrepreneurship enables economic growth, development and prosperity.

This chapter is primarily concerned with protective-tier entrepreneurship using blockchain technology to create and develop the cryptoeconomy. The importance of such institutional entrepreneurship has recently gained prominence within development economics in relation to the institutions within territorial nations that enable trade, growth, and thus development. The central contribution of this chapter is to connect the insights from 'new development economics' to inform the contemporary problem of developing the cryptoeconomy, thereby providing a greater understanding of the entrepreneurial development of blockchain technology. What this reveals is that protective-tier entrepreneurial efforts of cryptosecession to create the cryptoeconomy are analogous to the new development economics understanding of coordinating knowledge to discover complementary institutions. However, while in a developing nation this coordination process can occur hierarchically through government planners, the decentralised nature of the cryptoeconomy means that the process of economic

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<sup>6</sup> This is a constitutional-level in the sense that "they offer a framework on which diverse ends can be pursued" (Berg and Berg 2017, p. 3).

development is governed by coordination between entrepreneurs (whether that governance is on-chain or off-chain). From this perspective, the current widespread collaboration surrounding blockchain technology—in ‘innovation commons’ such as in Bitcoin Embassies, hackathons and conferences (see Allen 2017; Allen and Potts 2016a)—can be identified as a form of privately governed economic development facilitating exit to the cryptoeconomy.

## **2. Creating the cryptoeconomy**

The various applications of blockchains as a governance technology, and the new cryptoeconomy that they form, are different to other techno-economic paradigms such as the peer-to-peer or sharing economy. Applications of blockchain are unique because they enable exit from political-socioeconomic systems towards non-territorial governance structures (Markey-Towler 2018). While the cryptoeconomy does not have a geographic location, centralised political structure or hierarchical legal system, it enables a spontaneous ordering of exchange. This new decentralised structure of the cryptoeconomy is based on the creation of new native value systems—that is, new economies. This section briefly outlines two categories of blockchain applications based on their differential attempts to exit existing territorial protective-tier institutions, before considering some entrepreneurial costs to that cryptosecession.

Entrepreneurs can apply blockchain technology while maintaining recourse to existing state-based public institutions, such as enforcement of property rights and the settling of disputes through the courts and legal system. In the Leeson and Boettke (2009) distinction outlined above, applying blockchain in this way is entrepreneurship primarily on the ‘productive-tier’—operating either directly in, or in the shadow of, existing state-based institutions of enforcement (Mattila 2016). Blockchain applications within the finance industry, for instance, may achieve efficiency gains and lower costs while maintaining contracts that are resolved through the court system.<sup>7</sup> Indeed, new technologies are

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<sup>7</sup> The question of whether contracts voluntarily entered into within cryptoeconomic systems will be mutually recognised in existing legal systems is still an open and important question.

generally applied or integrated within the existing institutional architecture, and when disputes arise they are dealt with through gradual integration into the courts or private arbitration.

However, one of the central features of blockchain technology is its potential as a governance technology. That is, as a tool to *exit* existing governance structures. Blockchain entrepreneurs can create institutional enforcement mechanisms to secure property rights and facilitate trade—that is, protective-tier entrepreneurship (Swan and De Filippi 2017, p. 611)—that competes with other forms of organisation, rather than operating in their shadow. This process of *cryptosecession* occurs when entrepreneurs apply blockchain technology to create new decentralised governance structures that replace existing hierarchies such as firms and governments. Over the longer term, individual efforts of cryptosecession may lead to political rupture because blockchain better solves governance issues such as opportunism (MacDonald 2015).

Where blockchains are comparatively effective at solving economic problems—such as substitutability and complementarities as outlined by Markey-Towler (2018)—individuals may choose to exit from existing enforcement mechanisms and move towards decentralised private blockchain-based governance. This choice for individuals to cryptosecede is a question of their subjective perceptions of the relatively costs of territorial versus non-territorial institutions (see Allen and Berg 2017). While explaining the political economy of the boundaries of the cryptoeconomy is beyond this chapter, it is useful to briefly ask why entrepreneurs would choose to cryptosecede. This question is closely linked with the motivations of the original cypherpunks who developed the technology.

There was no mention in the original bitcoin white paper of integrating within the governance structures of the existing world (Mougayar 2016; Nakamoto 2008). Indeed, the aim was to shift governance away from the centralised power of hierarchical firms and states (Popper 2015). Applications such as smart contracts and decentralised autonomous organisations explicitly aimed to eschew all reliance on legal contracts (Buterin 2014). This motivation can be stated through the institutional possibility frontier (Djankov et al. 2003) as developing a technology that lowers the costs of disorder from private

expropriation and lowers the costs of dictatorship through public expropriation. Furthermore, applying blockchain within the existing political-socioeconomic institutions may face regulatory uncertainty and resistance as incumbents lobby to defend their territory (see Juma 2016) and draw blockchain technology within existing regulations, potentially suppressing its benefits (e.g. Harwick 2016; Nair and Sutter 2018). The decentralised nature of blockchain may increase the transaction costs of organised rent-seeking from others seeking to hold back blockchain technology, thereby reducing the cost of exit.

While on one hand cryptosecession partially overcomes the resistance and tension with existing regulation, this choice is not costless. There is likely to be a combination of both territorial institutions and non-territorial institutions—a combination that will be discovered when their comparative efficacy at governance exchange is tested and trialled. Partly this will be due to the entrepreneurial costs of discovering decentralised governance enforcement mechanisms. Take the example of OpenBazaar, which is a peer-to-peer decentralised marketplace with core governance based on blockchain technology. To be truly decentralised, the team at OpenBazaar therefore had to form trusted governance structures that verify and secure pseudonymous trades without recourse to state-based enforcement or the organisation itself. That is, they had to undertake protective-tier entrepreneurship in two directions: a decentralised enforcement mechanism and a decentralised reputation mechanism.<sup>8</sup> There is also a growing focus on the use of blockchain technology to facilitate collective decision making over rules themselves—that is, the formation of a cryptodemocracy ordered by blockchain technology (Allen et al. 2017; Berg 2017). This is also understood as a form of protective-tier entrepreneurship that may ultimately be used to replace some decision making within the territorial economy, raising interesting questions over the dynamics of decision making in groups when votes or stakes can be coordinated in a decentralised way.

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<sup>8</sup> The central institutional governance mechanism involves two parties creating a contract which is sent to a third party (the moderator) who witnesses the contract and creates a multisig account. While there are no fees on the system, individuals can decide to pay for dispute resolution, and the third party can receive funds through tips.

Cryptosecession, as we have seen here, must be intimately linked with entrepreneurial discovery of self-enforcing and self-executing institutional mechanisms of governance. Indeed, the notion that the early stages of a new industry or technology face a different set of economic challenges than a completely formed industry is not a novel concept (e.g. see Aldrich and Fiol 1994). For blockchain entrepreneurs this is intuitively clear: they lack precedent over the institutional structure in which they operate and are seeking to change.

The challenge of cryptoseceding is a coordination problem requiring information about future changes in the state of the world, business models, financing, timing, and consumer demand, competitors, failed ventures, and so on. Blockchain entrepreneurs must also must discover, create and test novel institutional structures and mechanisms that act as the core ordering principle of governance. This requires the discovery of self-contained and self-executing mechanisms of blockchain governance that are not embedded in the existing institutional environment. In this way the entrepreneurial process of cryptosecession is best viewed not just through the lens of a new industry, but rather from the perspective of developing the protective-tier of a *new economy*.

In the following section we examine this economic problem using the development economics literature. Therefore, in the following sections we first describe the economics of development before examining how this literature applies to the cryptoeconomy and cryptosecession. and cryptoeconomy and cryptosecession as outlined in the previous section.

### **3. Institutions, entrepreneurship and development**

The economics of development is primarily concerned with the origin of economic growth, and thus the drivers of prosperity. The various approaches to this problem, however, range from the mid-twentieth century mainstream allocation and efficiency focused ‘old development economics’ (Chenery and Strout 1966; Domar 1946; Harrod 1939) to the entrepreneur-centred and institution-centred ‘new development economics’ (Engel 2010). While the old development economics explained economic growth using allocation, investment and accumulation of capital (e.g. Rostow 1990; Swan 1956), the new

development economics brought several new foci to the forefront of growth and development: the complexity, stickiness and path dependence of both formal and informal institutions; the epistemological limits of allocating investment through centralised governments; and the importance of bottom-up entrepreneurial discovery for overcoming uncertainty (e.g. Bauer 1976). These understandings about the growth of developing nations can help us understand the challenges in the development of the new decentralised cryptoeconomy.

Chenery and Strout (1966) argued that one of the core problems facing developing nations was a savings-investment gap. Once identified, this savings gap needed to be filled through either government intervention or aid.<sup>9</sup> In addition to the need for further savings, the ‘big push’ theory also proposed that economic development required several coordinated investments in different sectors of the economy because the marginal product of investments was higher when made simultaneously (Murphy et al. 1989; Rosenstein-Rodan 1943, 1961). That is, investments exhibit complementarity.<sup>10</sup> Because of fundamental uncertainty over those complementarities, a ‘big push’ of investment required not just foreign aid to meet the minimum level of investment, but also some centralised government *planning* of where those investments should be allocated within the economic system (see Jomo and Reinert 2005). It is in this context that new development economics emerged and pushed back on this capital-centred and planning-centred approach to economic development.

Throughout the 1980s, a resurgence of institutional economics and entrepreneurial theory, a range of historical failures of centralised planning, and a falling of the neoclassical consensus, led to the realisation that investment and centralised planning weren’t the standalone key to development (Boettke et al. 2007; Coyne and Boettke 2006). Many criticisms of the old approach to development focused on

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<sup>9</sup> As Chenery and Strout (1966, p. 268) notes in the first paragraph: “For most underdeveloped countries, foreign assistance is already a critical source of development finance and one of the main hopes for accelerated growth in the future.”

<sup>10</sup> As Murphy et al. (1989, p. 1004) note: “spillovers give rise to the possibility that coordination of investments across sectors—which the government can promote—is essential for industrialization”

the notion that while a minimum quantity of investment may be a necessary condition for development, it is not a sufficient one (e.g. see Rosenstein-Rodan 1961, p. 2). It became increasingly clear that the study of economic development needed to incorporate institutions and entrepreneurship.<sup>11</sup> Focusing solely on investment and capital accumulation ignores the reality that information is imperfect and economies are complex. Institutional analysis, governance and knowledge coordination were brought to the foreground of the economics of development and growth (e.g. Acemoglu and Robinson 2010).

Persistent critiques of the role of government in economic development slowly severed the connection between central planning and development. Effective state-led investment requires both an omnipresent state (to overcome the complementarity and allocation of investment problem) and an omniscient state (to know those sectors or investments which are necessary for success). Indeed, Bauer (1976) argued that the central problem with foreign aid was a *knowledge problem*: how could a planner ever hold the necessary information for aid to be successful and effective? Economic development became focused on how distributed and dispersed contextual information can be coordinated through institutions and put to use to meet human needs (Glaeser et al. 2004). Development, then, is a discovery problem—a job for the *entrepreneur* (e.g. see Kasper and Streit 1998). As we will see in the following section, we can also approach this process of cryptosecession and the emergence of the cryptoeconomy as an economic development problem.

#### **4. Cryptosecession as an economic development problem**

The approaches and understandings of new development economics have clear parallels with the economic problem of developing the cryptoeconomy. In part, economic development is driven by

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<sup>11</sup> New development economics emerged on a different set of analytical principles and intellectual traditions (Fine 2006; Rodrik 2008), following advances in entrepreneurial theory (e.g. Kirzner 1978), new institutional economics (e.g. North 1990; Williamson 1975), and Austrian economics (e.g. Mises 1949).

entrepreneurial discovery of the complementarity of various combinations of heterogeneous capital (Leeson and Boettke 2009; Manish and Powell 2015). For blockchain, this entrepreneurial discovery of the institutions of the cryptoeconomy occurs under fundamental and radical uncertainty, compounded by the quick development of blockchain technology (see Lachmann 1976; Shackle 1992). Blockchain entrepreneurs must develop institutions that incentivise individuals to exit the existing state-based political-socioeconomic system. In this way the development of the cryptoeconomy is perhaps the most explicit form of protective-tier entrepreneurship yet, given that there are no existing protective institutions, and that those institutions must be publicly secure and verifiable, as well as trusted. As the brief example OpenBazaar revealed, cryptosecession requires the discovery of institutions necessary to enforce exchanges of information on distributed and secure public ledgers. The understanding aligns with Williamson's hierarchy of institutions and entrepreneurship, as outlined in Bylund and McCaffrey (2017): at deeper levels of institutional entrepreneurship—of shaping public affairs and institutions—entrepreneurs face a higher level of entrepreneurial structural uncertainty. Indeed, to cryptosecede to the cryptoeconomy requires its own knowledge structures, enforcement, and incentive mechanisms built in; the institutional environment cannot be taken as given, it must be created.

What's more, blockchain entrepreneurs not only have to discover the enforcement mechanisms of each blockchain application, but also the most basic institutional structures that connect those applications together. In this way cryptosecession requires the discovery of blockchain complementarities. Capital goods are heterogeneous and exhibit complementarities in the sense that they satisfy different plans for human actors. They also have "multiple specificity" in the sense that capital can be put to use in different plans (Lachmann 1956). Blockchains not only exhibit complementarity both with existing technologies (e.g. the internet of things) and institutions (e.g. firms and government), but also with other heterogeneous blockchains within the cryptoeconomy itself. The range of blockchains within the cryptoeconomy exhibits heterogeneity and multiple specificity because blockchain technology can be applied to multiple problems, and they can also be combined and used in multiple plans. The entrepreneurial

development task, then, is to make judgements over how these bits of capital will be structured to form the cryptoeconomy. This is an entrepreneurial problem requiring discovery of how each potential application for blockchain will fulfil a need, yet also discover how the other blockchains within the cryptoeconomy will interact with the new institution. Blockchains also exhibit complementarity with other blockchains within the cryptoeconomy because the technology multiplier applies on inter-blockchain interactions (an investment in one application of blockchain will alter the return of a different blockchain). Multiple decentralised processes of blockchains in the cryptoeconomy can interact, which lowers the cost of additional blockchain applications.<sup>12</sup> For instance, the decentralised marketplace OpenBazaar is a complementary application to other cryptocurrencies. The development of platforms such as Ethereum and NEO enable the creation of interacting blockchain applications. The success of a remittance business not only relies on transferring value between different individuals, yet also requires exchanges in each jurisdiction.

There are two critical differences between the economic development of a territorial economy and the economic development of the non-territorial cryptoeconomy. First, the cryptoeconomy has few existing institutional systems, or even norms. While development economics tends to recognise that the existing indigenous institutions matter (see Coyne and Boettke 2006)—including for instance skills, culture and conventions—this is unique for the blockchain ecosystem because there are no clear existing institutions. Indeed, cryptosecession could be understood as a private effort to ‘shock’ and overcome the path dependence of existing sovereign institutions (Boettke et al. 2008).

Second, there is no central planning authority to guide the discovery of institutions. While, as discussed above, the economics of development shifted from a focus on capital and investment towards institutions and change, the question of precisely how those institutions change given issues such as stickiness and path dependence remains unanswered.

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<sup>12</sup> This may lead to a type of multi-level selection as the cryptoeconomy develops—between the decentralised institutions of the cryptoeconomy and state-based political-socioeconomic institutional systems (e.g. see Hamilton 1964; Wilson et al. 2013)

Recent efforts include the use of private cities (e.g. Rajagopalan and Tabarrok 2014) and charter cities (Fuller and Romer 2012), both of which are attempts to push significant shifts in institutional mechanisms through developing special economic zones. However, such territorial special economic zones require state-based political change. Cryptosecession, on the other hand, requires no sovereign permission to change institutions—it is a privately driven entrepreneurial process—but can still be viewed through the same lens of changing existing institutions. In this way cryptosecession and the development of the cryptoeconomy can be viewed as a permissionless non-territorial special economic zone.

The entrepreneurial process of discovering the institutions of the cryptoeconomy does not occur within an institutional vacuum. Blockchain entrepreneurship requires non-price coordination of distributed information about market opportunities (Allen and Potts 2016a, 2016b). Indeed:

Economic development is an eternal process of innovation, in which economies make progress as they discover a better combination of activities, or a better system of coordination. The discovery of any new system, by its nature, cannot be designed or even anticipated; all we can do is to design a better search mechanism or discovery procedure.—Matsuyama (1997, p. 149)

This raises a question: If not through government planning, what is the search procedure underlying the development of the cryptoeconomy? When Easterly (2006) criticised the old development economics paradigm he shifted attention away from ‘planners’ towards ‘searchers’ in driving development. Searchers are necessary because of the inherent epistemological challenges in economic development. The blockchain cryptoeconomy does not have a central planner—it is governed by the consensus of the nodes maintaining the system through various blockchain protocols. Although attempts have been made to create quasi-state off-chain bodies, such as the Bitcoin Foundation, to coordinate some aspects and facilitate debates the cryptoeconomy itself has no centralised sovereign. This is despite the fact regular debates within the blockchain and bitcoin community concern the most effective

mechanisms to maintain the robustness and efficiency of the cryptoeconomy (e.g. see van Wildum 2016).

Because there is no centralised sovereign state within the cryptoeconomy, the entrepreneurial development process must be *privately governed* by ‘searchers’ rather than *publicly governed* by ‘planners’. The implication of having no sovereign state—the cryptoeconomy is more accurately described as having sub-components of economies—is that the development of the cryptoeconomy must be a bottom-up ‘searching’ entrepreneurial process. Indeed, the new development economics literature has previously examined how the private governance of development may be optimal as compared to poorly performing states (Leeson and Williamson 2009).

As we have seen here, entrepreneurial coordination within the blockchain ecosystem requires comingled discovery of protective-tier technologies. Blockchain entrepreneurs are not only concerned with their own market opportunity, but are also concerned with how other agents are acting on their opportunities. How are blockchain entrepreneurs solving this problem? Initial evidence suggests that blockchain entrepreneurs are collaborating and coordinating in private polycentric governance mechanisms to share information under collective action rules (Allen 2017). These blockchain innovation commons—such as Bitcoin Embassies, hackerspaces and conferences—involve entrepreneurs pooling and coordinating non-price information to develop the cryptoeconomy.

In this way, the contemporary collaborative nature of the blockchain ecosystem can be viewed as a robust system of private institutional controls to develop the cryptoeconomy in the absence of a nation state. This suggests there are in fact *two* levels of protective-tier technologies developing the cryptoeconomy, which are not at first clear. The lower level is the collectively developed rules within innovation commons where blockchain entrepreneurs govern non-price information necessary to apply blockchain technology—where entrepreneurs seek to discover opportunities. This level of protective-tier technologies includes, for instance, the reputation mechanisms, signalling and nested hierarchies of rules that constitute Bitcoin Embassies, hackathons, online forums and mailing lists. Each of these involves protective-tier entrepreneurship in

the sense that entrepreneurs must overcome the hazards of coordinating non-price entrepreneurial information. The higher level of protective-tier technologies are those that constitute the cryptoeconomy itself, which enable individuals exchanging within the cryptoeconomy to enforce and coordinate their economic activities outside of territorial nation states. Together, these governance mechanisms are entrepreneurial efforts to lower the costs of political-socioeconomic exit, thereby developing the new decentralised cryptoeconomy.

## 5. Conclusion

This chapter has made theoretical connections between development economics and the entrepreneurial problem of developing the blockchain cryptoeconomy. The process of cryptosecession to the cryptoeconomy is an entrepreneurial process of discovering complementary governance structures that may more effectively govern than existing hierarchical firms and governments. My central proposition is that while in developing territorial nations institutional discovery may be undertaken by centralised governments—that is, through central planning—the non-territorial cryptoeconomy must be developed privately by entrepreneurs. This provides a greater theoretical explanation for the range of collaborative innovation commons where blockchain entrepreneurs are undertaking institutional discovery. By drawing the connection between development economics and the entrepreneurial challenge of the cryptoeconomy, this chapter has provided a better understanding of the institutions necessary for the development of the cryptoeconomy, and provides direction for future fruitful research between development economics and the economics of blockchain.

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