Cryptodemocratic Governance of Special Economic Zones

Darcy W.E. Allen¹ and Aaron M. Lane²

This version 22 April 2020

Abstract: Special jurisdictions are testbeds for institutional experimentation that require voting mechanisms to make complex and evolving policy decisions. In this paper we explore how blockchain technology—as a new infrastructure for voting rights—might be applied in special jurisdictions. In a cryptodemocracy, voters are given property rights in their own votes that are recorded on decentralized blockchain ledgers (Allen et al. 2019). Votes in a cryptodemocracy can be given different bundles of property rights—such as the ability to delegate votes—that changes the structure of the democratic system. Our aim in this paper is to explore the underappreciated collective choice problems underpinning special jurisdictions, outline the potential for cryptodemocratic voting systems as new infrastructure for special jurisdictions, and propose a new interdisciplinary research program at the boundaries of institutional economics, political science, and innovation economics.

Keywords: Special Economic Zones, Blockchain Technology, Robust Political Economy, Cryptodemocracy, Blockchain Voting

1. INTRODUCTION

Special Economic Zones (SEZs) are classes of special jurisdiction where geographic areas have different rules—such as lower taxes or fewer regulations—compared to host jurisdictions (e.g. see Akinci et al., 2008; Bell, 2017). New special jurisdictions represent a devolution and decentralisation of political power, spurring diverse governance structures that differ widely in terms of their policies, size, funding and governance. Special jurisdictions matter because they have historically generated political, social and economic liberalisation.

There is a long history of research examining SEZs, much of which examines their economic performance compared to the host jurisdictions (for examples of research on special jurisdictions see Devereux and Chen, 1995; Fenwick, 1984; Liang, 1999; Wang, 2013; Yeung et al., 2009). In this paper

¹ darcy.allen@rmit.edu.au
² aaron.lane@rmit.edu.au
we contribute to the understanding of special jurisdictions by exploring the potential for blockchain-enabled voting infrastructure to facilitate the collective choice problems of special jurisdictions. Special jurisdictions provide a comparatively effective environment for experimentations in new forms of democratic governance. Therefore, our analysis might not only facilitate some of the collective choice frictions in special jurisdictions (including transparency, accountability and corruption of governments and private governing bodies) but also have broader effects on our understanding of alternative democratic structures.

An underappreciated problem for special jurisdictions is the need to make choices in groups—that is, collective choice infrastructure. Special jurisdictions require collective choices to be made under uncertainty, over a wide range of policy alternatives, and with fuzzy stakeholder groups. Some of those choices are in the initial establishment and founding of a zone, such as where a zone is located (e.g. what policy margins does a zone differ from the host jurisdiction?), while others are necessary as special jurisdictions develop and evolve (e.g. what initial polices were not fit for purpose and must be changed?). In special jurisdictions these choices are exacerbated by often high levels of migration and policy uncertainty, as well as a complex and competing mix of private and public stakeholders. These governance challenges, however, present an opportunity for alternative democratic structures enabled by new technologies.

Blockchain technology was originally developed to power the digital currency, Bitcoin (Nakamoto, 2008). More broadly, blockchains are decentralised and distributed ledgers where a network of computers maintain consensus over shared data—and can undertake shared computations—using economic incentives. Blockchains are a new type of decentralised infrastructure (Allen, Berg, Novak, et al., forthcoming; Berg et al., 2019; Davidson et al., 2018; Werbach, 2018). Blockchain protocols are now being developed with a range of different characteristics in terms of cost, speed, privacy and security. To the extent that blockchains provide trust more effectively than firms or governments, we would expect some exchanges and activities previously maintained by centralised ledgers to shift towards decentralised blockchain networks (see Davidson et al., 2018). While blockchains are now being applied in diverse areas that are relevant to the success of and investment in special jurisdictions—including supply chains, charity donation tracking and property registries—our focus is on their application to solve problems related to voting.

A cryptodemocracy is a new type of collective choice infrastructure that uses blockchain technology for coordinating voting property rights (Allen et al., 2019; Allen, Berg, Lane, et al., 2018). Rather than votes being recorded centrally by governments and organisations, blockchains enable votes to be recorded in a decentralised way. Not only might this overcome challenges including transparency and voter fraud, but this infrastructure opens the ability for voters to trade, decompose and delegate their
voting rights to others, creating an entirely emergent democratic structure (see Section 3 below). Cryptodemocracies facilitate proposals for innovations in democratic governance—such as quadratic voting—that can be enabled by embedding rules into the protocol that constrain voting rights in different ways. Therefore a cryptodemocracy should be understood as the general infrastructure on which democratic structures can be designed and built. The new institutional structures that blockchains enable through cryptodemocracies can be more dynamic and non-territorial, can integrate more knowledge into collective choices, and can make democracies more accountable and responsive.

In this paper we explore the potential for cryptodemocratic governance to ameliorate challenges in designing and governing special jurisdictions. Aside from the opportunity for cryptodemocracies to overcome the collective choice problems facing special zones, there are several other reasons why connecting these two areas appears fruitful. First, special jurisdictions have a comparative advantage in testing policy ideas—they are highly experimental testbeds. The application of cryptodemocracies in special jurisdictions extends that experimentation beyond policy to the very structure of the political regime. Special jurisdictions may be more effective to experiment with cryptodemocracy compared to existing jurisdictions because of they lack entrenched political systems and interests that might block reform.

Second, the opportunity for experimentation extends beyond the borders of the special jurisdiction within which cryptodemocracy could be trialled. Historically the policies from special jurisdictions have spread to host jurisdictions, sparking “liberalization avalanches” far beyond initial comprehension (Moberg and Tarko, 2014). China’s experience demonstrates the way that this contagion effect can occur (e.g. see Crane, 1990, 1994; Montinola et al., 1995). The first special zone in China (Shenzhen) was implemented in 1980. The lessons from five initial zones were quickly expanded across other areas of the country. By 1992 all provincial capitals were special zones (see Yeung et al., 2009). In the same way, cryptodemocracies may be first applied in special jurisdictions before being exported to other jurisdictions. Cryptodemocratic governance of special jurisdictions might not only facilitate zone governance, but provide insights into innovative governance for existing jurisdictions seeking to reform their democratic structures.

This paper proceeds in the following way. In the second section, we introduce special jurisdictions and their need for collective choice infrastructure to discover new policies (knowledge problems) and to incentivise good governance (incentive problems). In the third section, we introduce the challenges of designing systems for collective choice, including a range of proposals to improve the functioning of democracy. In the fourth section, we define and introduce cryptodemocracies, including their theoretical properties. In the fifth section, we consider how cryptodemocracy might be applied in special
jurisdictions and deployed to facilitate zone governance. In the sixth section, we conclude by discussing a new research program.

2. WHAT MAKES SPECIAL JURISDICTIONS ROBUST?

Special jurisdictions exist amongst the messy and complex reality of a political-economy system. Here we use the robust political economy framework to help understand the governance problems of special jurisdictions (Boettke and Leeson, 2004; Leeson and Subrick, 2006; Pennington, 2011). Institutional governance systems are more robust if they deal comparatively well with knowledge problems (discovering effective policies) and incentive problems (preventing opportunistic behaviour). Moberg (2015, p. 169) has applied this framework to special jurisdictions to argue that “decision makers need both be able to find the proper policies for the zones and have the incentive to implement them.”

Special jurisdictions face unique and exacerbated knowledge problems. Knowledge problems arise because information is distributed about an economy in the minds of individuals and individual preferences are not given but must be discovered (Hayek, 1945). In special jurisdictions this knowledge must be coordinated to make decisions about the ‘rules of the game’ themselves. Special jurisdictions need institutions to make collective decisions such as the breadth and extent of reform in the zone, the structure of the political system and how the jurisdiction will maintain governance autonomy. Policies within special jurisdictions also need to change dynamically—while a special jurisdiction might begin with simple reductions in tariffs, it might later require reform to immigration restrictions to attract workers. These highly uncertain and dynamic choices underscore the need for collective choice infrastructure in special jurisdictions. The more effective that infrastructure is at coordinating knowledge will better solve knowledge problems and make the jurisdiction more robust through time.

The institutional frameworks in special jurisdictions must also deal with incentive problems. Political elites and powerful companies can and do act in self-interested ways that may lead them away from providing effective governance. They must be held accountable for their actions and be incentivised to provide good governance. This raises the question of how we can implement institutions that encourage peaceful cooperation and exchange (“inclusive” institutions) rather than “extractive” institutions (Acemoglu and Robinson, 2012). There are two main ways to ameliorate the incentive problem in special jurisdictions (Lutter, 2017; Moberg, 2015): privatisation and democratic accountability.
Privatisation can help to align the incentives of investors, administrators and citizens by giving the governing body a stake in the outcome. Proprietary cities have three main characteristics: the land owner as a private for-profit entity; they have a high degree of legal and regulatory autonomy; and they have a “meaningful role in creating and enforcing the legal system” (Lutter, 2017, p. 2). Such a system can enable experimentation and discovery of new institutional systems, partly because they can begin from a blank slate rather than approaching reform at the margin. While autonomy and privatisation can help align incentives and encourage innovation, it can also create other incentive problems. The role of the host government in a proprietary city—at the most basic level providing a separate company or group of companies autonomy to govern over a territory—creates complex incentive relationships between private investors, citizens and governments. Private autonomous governance can ameliorate both knowledge problems (through decentralised institutional entrepreneurship) and incentive problems, through more accountability and preventing the encroachment of external interests.

Democratic accountability can also help solve incentive problems by making those who govern accountable for their decisions by those subject to them. Corporate and political elites should gain—by maintaining power—from making good policy choices. Coupled with this is the notion of decentralization of governance that gives local officials the incentive to make good choices and contribute to solving the knowledge problem (Moberg, 2015). This notion of decentralization and devolution of power—and the additional accountability that comes with it—also creates external political and governance challenges. Special jurisdictions must maintain complex relationships with host governments.

One example of this tension with governments, as Bell (2017) charts as a case study in his recent book, is the tumultuous history of special zones in Honduras. In 2011, the Honduran Congress (almost unanimously) voted in favour of constitutional amendment to enable a new form of special zones. These zones were to be extensive including more autonomous commercial laws, public administration, courts and policy—including the power to tax. Then, in 2012, the Supreme Court struck down the proposal on the basis that it was unconstitutional. Later, in 2013, Honduras passed legislation that enabled another type of special zone called a ‘ZEDE’. Some of these inventive problems between special and host jurisdictions can be overcome through institutional design. For instance, implementing arrangements where special jurisdictions remit money back to the central government but remain the residual claimant on profits. For instance, in Honduras, each ZEDE is required to remit 12 per cent of tax revenues back to the central government.

In this section we have outlined the unique need for special jurisdictions to solve knowledge and coordination problems through collective choice—that is, voting—infrastructure as well and as the challenges of governance more broadly. We have argued that these jurisdictions have unique and
dynamic governance problems. Effective governance structures that solve knowledge and incentive problems—particularly for private zones—are critical for jurisdictions to compete and attract investment. Making actions by special jurisdictions—and delegations of host governments—more credible will help to attract investment due to the stability of the institutional regime.

3. THE COLLECTIVE CHOICE PROBLEM

To understand innovations in democratic governance we must first understand the nature of collective choice. We structure democracies to make group decisions. Coordinating decisions in small homogenous groups is easy. With more participants and with diverse preferences, group decisions become hard—there are substantial transaction costs in integrating preferences into decisions about what governments should, should not, can and cannot do. One common way to overcome the costs of this group decision-making problem is through the mechanisms of representative democracy. We elect political representatives in defined geographical areas (i.e. electorates) through a one-person-one-vote election process, and then those representatives vote on our behalf. These representatives might also be organised into multiple houses of parliament, creating a supermajority (where in effect more than 51% of votes are required to change rules). Power is then delegated to other statutory bodies to enforce and administer that legislation. In this way representative democracies both enable people to take part in decisions, while also delegating day-to-day powers away from the entire franchise. From this perspective, democratic mechanisms are complicated and intricate processes for collective decisions in a world of positive transaction costs.

There have been several recent scholarly efforts to propose new institutions to improve collective governance processes. Let us briefly examine three such proposals of Quadratic Voting (QV), Epistocracy, and Futarchy. It is important to note that these are not necessarily alternatives to cryptodemocratic governance (that we describe in Section 4). As a cryptodemocracy does not presuppose the structure of any democratic system—it is infrastructure for coordinating voting rights—each of these proposals could be implemented as rules constraining voting rights.

First, Quadratic Voting (QV) is a rule where voters may purchase additional voting rights for a price that is a square of the number of votes purchased (Posner and Weyl 2015). After the vote, the money collected is redistributed to the voters on a per capita basis (Posner and Weyl 2015). QV attempts to avoid the tyranny of an apathetic majority associated with the traditional ‘one person, one vote’ rule where the democratic outcome may not reflect the intensity of preferences of the collective group. Under QV, the number of votes cast is not fixed, however the quadratic nature of the voting rule means
that “it becomes prohibitively expensive for a small group of wealthy individuals to affect the outcome” (Allen et al, 2019, p. 80). QV could be implemented using blockchain (Allen, Berg, Lane et al, 2018) or as a governance infrastructure to support blockchain communities more generally (Buterin et al. 2018).

Second, epistocracy or the ‘rule of the knowledgeable’ is a proposal to weight voting rights according to a voter’s knowledge and intelligence (Brennan 2016). This proposal seeks to ameliorate perceived problems with ‘one person, one vote’ rule where the aggregation of preferences is not efficient because voters may be biased, misinformed, or ignorant of the policies and candidates that they are voting for. A practical application of this using blockchain infrastructure is the political movement ‘Flux’, where voters can choose to delegate voting rights to trusted experts (voteflux.org).

Third, Futarchy seeks to harness speculative betting markets as an alternative mechanism for aggregating knowledge about which policies should be implemented. Under this system, voters would decide the political goals while betting markets would determine the specific actions that the elected government would implement and administer. The basic rule of Futarchy is “when speculative markets clearly estimate that a proposed policy would increase national welfare, that policy becomes law” (Hanson 2013, p. 152). There has been speculation that this system could be used for the governance of Decentralised Autonomous Organisations (Buterin 2014; Merkle 2016).

Each of these proposals seek to create a new arrangement of voting property rights. This raises the question of how we can compare them. What is the purpose of democratic voting, and how can we judge the effectiveness of a democratic system? The benefits of democracy come through its “dynamic process” and the “formation of opinion” (Hayek 1960). Indeed, as Hayek (1960) notes, the “… chief advantage [of democracy] lies not in its method of selecting those who govern but in the fact that, because a great part of the population takes an active part in the formation of opinion, a correspondingly wide range of persons is available from which to select.”

The way we structure democratic institutions has changed through time and is affected by technological change. New technologies change how we deal with transaction costs and enable us to organise ourselves in new ways. Over millennia, technologies have created new possibilities by changing the way we record and organise votes. History demonstrates new technologies do not just lower the costs of existing collective choice institutions, they fundamentally change the shape and functioning of collective choice infrastructure. Communications technologies—including writing—enabled us to lodge and record votes. Some technologies, such as the Kleroterion in Athenian polls, were specifically invented to reduce opportunism by ensuring the process of random sortition was not compromised. The printing press enabled us to use printed ballot papers and facilitated representative democracy over
greater distances. The internet has not only facilitated complementary parts of democratic governance, such as the free press, but also promise more direct democracy by lowering the costs of frequent online voting. Democracies do not just get faster and cheaper when we invent new technologies of choosing. Technologies make new democratic mechanisms possible.

Democratic structures solve knowledge problems and incentive problems in different ways. On one hand, direct democracies integrate more dispersed knowledge through more frequent voting and therefore might ameliorate some knowledge problems. On the other hand, representative democracies (where we vote less frequently) put decision making power in representatives, but open the potential for agency and incentive problems.

We can think of votes as a bundle of rights—that gives you the capacity to do some things but not others with that property—that enable you to take part in a collective decision, to fulfil some democratic purpose. In modern elections, voting rights are tightly regulated and planned. Votes are evenly distributed across the adult population. Your vote must be cast at set times (perhaps every three years). You can only vote for the candidates in your geographical area in which you are registered. Your vote must also be made in secrecy at a polling booth (in the sense your vote cannot be externally verified). You cannot withdraw your vote once it is cast (wait three more years). You cannot vote directly on some issues, but delegate other decisions to representatives. Further, exercising your individual voting right is contingent on the pattern of other people exercising their voting rights. Some nations with compulsory voting, such as Australia, even compel you to exercise your right (or risk being fined).

Voting rights look the way they do for many reasons, but generally they exist to create some democratic political process. Those political systems variously seek to coordinate and aggregate information, or prevent the tyranny of the majority, or to make governments legitimate or accountable. Voting rights can change over time in relation to some desirable democratic processes, justified through greater efficiency of collective decision making. For instance, restrictions on your right to sell your vote is connected back to the potential of individuals imposing externalities on others, and the mapping on economic inequality onto political inequality (more on this later). It is in this context that blockchains demonstrate the potential to secure votes, opening the potential for more voting rights and new democratic structures. We refer to this underlying collective choice infrastructure that blockchains facilitate as cryptodemocratic governance.

4. INTRODUCING CRYPTODEMOCRACY

New technologies open new institutional possibilities—new ways to organise collective decision making—that were previously infeasible. We now turn to the opportunities that blockchain technology
presents as collective choice infrastructure. A ‘cryptodemocracy’ is a blockchain-enabled collective choice infrastructure on which individuals coordinate their voting property rights on a decentralised platform. A cryptodemocracy has distinct properties that may help ameliorate some of the collective choice problems identified in the previous section. In this section, we explore some of those properties before turning to the specific application of cryptodemocracy to special jurisdictions.

Blockchain is a decentralized and immutable digital database that is made possible through the combination of several technologies (including asymmetric cryptography, cryptographic hash functions, peer-to-peer networking, consensus algorithms, and game theoretic incentive design) (Berg et al., 2019). Blockchain was initially invented to support a trusted digital currency that did not require a centralised financial intermediary (Nakamoto, 2008). The applications of blockchains, however, extend well beyond finance and cryptocurrencies into areas such as enabling transparency in global supply chains and logistics (e.g. see IBM, 2018) through to powering a self-sovereign identity that protects privacy (e.g. see Sovrin, 2019).

It has also been proposed that blockchain can be as a new digital infrastructure for democratic decision making to give voters more wide-ranging voting rights, radically reshaping how democracies work (e.g. see Van Rijmenam and Ryan 2019; Allen et al., 2019). Democratic governance requires mechanisms for recording an entitlement to vote and managing where or how votes can be executed. Historically, these records have been centrally maintained by a trusted intermediary (such as an electoral commission for the conduct of public elections). There are well-known problems and controversies surrounding the integrity of centralised voting systems—such as the potential for bribery and corruption of central electoral authorities, ballot stuffing, vote-rigging, misplaced or destroyed votes, inaccurate and unauthenticated voter identification—as well as similar attempts in digitising those systems (see for instance Allen, Berg, Lane, et al., 2018).

Blockchain applied to democratic voting attempts to overcome issues of erroneous recording of voters and votes that comes from having a centralised voting process administered by a government entity. Rather than a centralised recording of votes it is possible that each voter could be given a cryptographically-secure token, recorded on a decentralized ledger, that represents their vote.

There are many reasons why distributed and decentralised blockchain ledgers may be effective for the problem of recording votes. For instance, “compared to standard centralised voting systems (where there is a single authority monitoring actions), a blockchain-based voting system can allow some level of decentralisation on the monitoring and implementation of the system’s procedures” (Dhillon et al 2019, p. 6). Bogucki (2017) also outlines several benefits of blockchain for the voting process including the robustness of a distributed system in the case of a server being compromised, and the potential...
protection of voter identities. One of the obvious benefits of such an infrastructure is that this ledger is publicly auditable providing transparency over the conduct of the voting process. Blockchain was originally introduced to solve the ‘double spending problem’ for digital currencies, but it may also solve the ‘double voting problem’. A blockchain-enabled cryptodemocracy can ensure integrity in collective choice processes not only for public government elections, but also for private companies (this is pertinent for special jurisdictions, which are increasingly operated by private companies).

But cryptodemocracy is not simply an application of blockchain to voting where the same democratic structures (e.g. representative democracy) are maintained. Cryptodemocracy does not presuppose any specific constitutional rules about the allocation those voting property rights (e.g. the franchise) or the specific rules regarding the exercise of voting property rights (e.g. voting districts, election cycles). Instead, a variety of different structures could emerge—which has far more radical implications:

A cryptodemocracy draws on the decentralization and cryptographic security of blockchain to establish and govern a system of property rights over votes. Once property rights over votes are allocated and enforceable, individuals are able to contract, exchange, and utilize their votes in a decentralized and evolutionary way. Cryptodemocracy provides for a democratic, polycentric, spontaneous and ordered system of collective choice that has not yet been possible under the existing institutional and technological framework. (Allen, Berg, and Lane 2019, pp. 138-139)

Compared to more familiar democratic structures, a cryptodemocracy theoretically exhibits some unique and desirable characteristics. By giving people cryptodemocratic voting rights and expanding their political freedoms, more local tacit knowledge can enter collective choices. Indeed, democratic processes are not a process of aggregating preferences to some objectively correct outcome, but rather a messy process of knowledge coordination and learning over subjective policy problems.

Cryptodemocratic governance can be applied to solve some of the governance problems underpinning special jurisdictions. There is potential here both for public elections (e.g. electing governments or administrative bodies) as well as within and between private and not-for-profit organisations (e.g. corporate shareholder voting or union governance). These opportunities could ameliorate some of the knowledge problems of special zones by incentivising the revelation of preferences and by making decision making more dynamic. Cryptodemocratic governance may also create new incentive structures, bringing about more responsive and accountable governance structures.

One reason why we expect a radical reshaping of democracy is that one of the reasons rights are restricted in existing democratic systems is because those voting rights could not be securely or reliably executed. Blockchain technology, together with smart contracting technology, enables a much more
extensive set of rights to be attached to votes, opening new structures of collective decision making. As we saw above, people have long proposed and discussed new democratic structures, contrasting them with our current rigid systems. That rigidity comes in part because we did not have the technology to overcome the transaction and political costs of more fluid and dynamic political group decisions. Blockchain, we argue, might bring those democratic structures into the realms of possibility through cryptodemocratic governance.

A cryptodemocracy is a technological infrastructure that facilitates the recording and contracting of votes between parties. Together, blockchains and smart contracts enable votes to become programmable and contractible. Given the complexity of such a voting system—with many layers and unbundling—a decentralised blockchain infrastructure for securely and transparently recording voting property rights is critical.

While the decision of what voting rights would be enabled in a cryptodemocracy is a constitutional decision written into the voting protocol—for instance, whether votes could be bought and sold, or some maximum amount of votes a single voter could acquire—it is worth exploring what some of those rights might be. Voters could be free to delegate (i.e. contract) to any other individual voter within the franchise, or even outside the franchise (rather than just their geographical representatives). Voters might be able to place conditions on those delegation contracts, such as time limits after which the voting right would return to the original holder. Voters might decide to retain their right to vote on certain issues (e.g. social issues) while delegating portions of their voting rights to others (e.g. economic issues). This unbundling of votes is of course limited by the extent to which such unbundling could be coded. Even further, voters might be able to buy and sell votes (integrating compensation into the voting contracts). But it’s not clear which way this money would flow: would voters sell their voting rights, or would they delegate their rights and pay delegates to act on their behalf? This final proposition—vote buying and selling—is controversial and worth further exposition.

A long history of stigma sits around voting markets. But there are several arguments for developing markets for votes. In ‘one person, one-vote’ systems with restrictions on voting rights, voters are unable to express their intensity of preference. It does not matter if you care a little or a lot about an issue, you only get to cast one vote. This means a reasonably indifferent majority can overpower a minority who cares very strongly about an issue. In product markets, we would solve this by enabling trade. Indeed, there are gains from trade between two blocks of voters, one of which can compensate the other for their voting rights. The core (utilitarian) argument for voting markets—that is, aside from arguments about fundamental freedoms of alienability of your vote—is that markets process information and integrate more preferences and distributed knowledge into a collective choice.
Arguing for vote buying is often quickly followed by vehement disagreement along three main directions (Allen et al., 2019, Chapter 5). The first problem, or concern, with voting markets is inequality. In this view the rich will buy all the poor’s votes. While there is reason to be fearful of economic inequality mapping onto political equality, one of the challenges with this objection is the reality that politics and money are already intertwined—but that money gets captured by the political elites through lobbying and funding. Logrolling processes also look very much like voting markets—except the transfers are between the representatives.

Another common argument for restricting vote buying and selling is inefficiency. In this argument there is a distinct difference between voting markets and other markets. In product markets each voluntary exchange can be mutually beneficial, and this might not impose externalities on others. In voting markets, while each exchange can be beneficial, the overall collective decision is imposed on everyone. That is, voting markets are bad and inefficient because they impose externalities. But democracies inherently impose externalities through group decision and enforcement. Indeed, as Jason Brennan (2016, p. 9) describes, there are fundamental differences in how democracies govern and individuals making other choices:

An electorate is not like an individual. It is a collection of individuals with separate goals, behaviors and intellectual credentials. It is not a unified body in which every person advocates the same policies. Instead, some people impose their decisions on others... Political decision making is not choosing for oneself it is choosing for everyone. If the majority makes a capricious decision, others have to suffer the risks.

Ronald Coase (1960) taught us that, with sufficiently low transaction costs, property rights will be bargained through contracts towards their more efficient use. Some have attempted to extend this understanding into the political sphere—where by giving people property rights in votes then opening voting markets (and lowering transaction costs) will internalise externalities. This is the “Political Coase Theorem” (PCT). But there are several arguments against PCT. For instance, Daron Acemoglu has argued against the PCT based on commitment problems. In this view, the Coase Theorem is based on the idea of credible commitments and enforceable contracts, and that these cannot exist within politics (e.g. Acemoglu, 2003). At the same time, however, as we will see further below “blockchain might facilitate a Coasian bargaining process—that is, the process of bargaining may tend property rights to their most valued use—by lowering agency costs of enforceability” (Allen et al., 2019, p. 78).

The third argument against voting markets is that votes are anti-commodified. In this view votes belong to the community, not you, and that because they serve a public purpose—group decision making—they should not be sold. The decision of whether to enable the bundle of rights within a cryptodemocratic voting right incorporate the buying and selling of votes is a constitutional decision—
including the potential for a middle-ground where votes can be bought and sold but with some other price restrictions attached, such as through quadratic voting (Posner and Weyl 2015).

While the exact scope and application of these cryptodemocracies will be discovered over time, we can explore some of the features of cryptodemocratic governance compared to more conventional governance structures. Through the delegation (and buying and selling) of votes, we would anticipate a cryptodemocracy to have interesting properties. First, cryptodemocracies will have emergent structures and centres of decision making. That is, cryptodemocracies will be polycentric. Cryptodemocracies are hard to define precisely because their structures are a “cosmos” (a spontaneously emergent order) rather than a “taxis” (a consciously planned order) (Hayek, 1973). The constellation of voting property rights at any given time is a function of voter preferences. For instance, politically active and aware voters could maintain their voting property rights and exercise the votes themselves. Others will delegate their entire voting rights for long periods of time to others.

Second, cryptodemocracies will be more knowledge-rich than conventional democratic structures. The process of delegation and coordination between voters and delegates will integrate more local and contextual knowledge into collective choices. Some of that knowledge, for instance, will come through the buying and selling of voting rights—which enables people to demonstrate their intensity of preference. Other knowledge will come through the process of delegation, where individual votes have more power to self-identify how and in what way they wish to take part in the political process. It’s worth examining again here some of the claims of voter ignorance and irrationality as described previously. In a cryptodemocracy voters—by having property rights within their own vote—will not homogeneously have the right to exercise their vote within predetermined constraints. Rather than some homogenous “bundle” of voter property rights being defined, individuals can more fully determine how they wish to engage.

What blockchain technology enables, we argue, are perhaps more emergent, dynamic and responsive forms of democratic governance—that is, collective choice infrastructure that better overcomes knowledge and incentive problem. These are precisely the challenges we have identified in the governance of special jurisdictions.

5. CRYPTODEMOCRATIC GOVERNANCE FOR SPECIAL ECONOMIC ZONES

While we do not know what cryptodemocracies will look like—because their structure is emergent—over the coming decades we are likely to see extended experimentation with cryptodemocratic governance infrastructure. These applications will implement different types of democratic systems with variances in the bundles of voting property rights given to voters. Where could we expect the first
application of cryptodemocratic governance? There are likely to be fewer barriers to application and adoption in the private sector, such as corporate shareholder voting. Over time we might see these innovative forms of governance in public elections, or within the operation of political parties themselves. Special jurisdictions are particularly well-placed for experiments. As we saw in Section 2, special jurisdictions have a range of overlapping and complex collective choice governance problems. But the comparatively autonomous nature of special jurisdictions also suggests they are well-placed for experiments in innovative governance. Partly because of entrenched interests and risk aversion, it’s highly unlikely that a new cryptodemocratic governance system would be implemented within a major established country in the near future. By contrast, the formation of new special economic zones can be a greenfield for new collective choice governance infrastructure. To be sure, cryptodemocracies are not a silver bullet for the governance challenges of special jurisdictions, but they provide a promising and complementary possibility for experimentation, in a unique environment that requires new institutional infrastructure.

Cryptodemocratic governance structures could be implemented in the public and administrative processes of new zones. This might make those governance structures more responsive and accountable to voters and to investors. These features could also be useful with the sometimes-rapid pace of migration, and the shifting shape of the franchise. As we saw, special jurisdictions have a wide range of challenges regarding knowledge coordination and discovery. The epistemic properties of cryptodemocratic governance—through the delegation and unbundling of rights—might enable more knowledge to be integrated into those political decisions, propelling a further process of institutional jurisdictional competition. Cryptodemocracies might therefore provide collective choice infrastructure for better public governance within special jurisdictions, lowering the costs and increasing the capacity of jurisdictional competition. Privacy technologies could also make zones more censorship-resistant to host nation demands. Smart contracts could be used to disentangle different political systems and ensure ongoing credible commitments around the terms of jurisdictional autonomy. For instance, smart contracts on blockchains could help ensure that tariff reductions will remain in place over the long term.

The applications of cryptodemocracies extend into the private sector too. As we have seen, there are an increasing number of zones that are privately funded and operated. One clear application of cryptodemocratic governance is for corporate shareholder voting (see Geis, 2018). Shareholders today are already contracting and delegating voting rights. Cryptodemocratic governance might make those processes much more efficient through blockchain-enabled share registries. This might further facilitate the development of privately funded and operated special economic zones. Even further, special jurisdictions could adopt Distributed Autonomous Organisations (DAOs) that draw on the local knowledge of citizens (or some other franchise or investor group) to make decisions around funding of
future infrastructure projects—as well as innovative ways to fund public goods such as dominant assurance contracts (see Tabarrok, 1998).

Cryptodemocratic governance could also help special jurisdictions scale. Given the benefits of trade and cities more generally (e.g. spillovers from co-location causing innovation) it is unsurprising that special zones tend to be more effective when they are large. A tension here is that we also know that one of the fundamental benefits of special jurisdictions at a broader scale is how they enable diversity and discovery over institutional sets. We want that process of discovery at a lower more disaggregated level—to draw both on local knowledge and to test and trial institutional entrepreneurship hypotheses—while maintaining co-location in physical space. This seems to be an inherent tension. We need a way for institutional entrepreneurs to create private governance structures—so that they are the residual claimants on those rules—seeking to facilitate contracting, and we need those structures to be able to overlap and compete within close geographical area. Blockchain enables private entrepreneurs—who have the incentive for their institutions to succeed—to spin up competing institutional governance structures to facilitate voluntary exchange (Allen, forthcoming). Cryptodemocratic governance, we argue, is a new mechanism for robust special jurisdictions that relies on the emergence and discovery of new institutions by sovereign institutional entrepreneurs (see Salter 2018).

6. CONCLUSION AND RESEARCH PROGRAM

Special Economic Zones (SEZs) are complex and entangled mixes of public and private spheres of collective choice. Some governance problems are at the public level, such as what taxation policies should be changed, or what physical infrastructure should be built. Other choices are in the private sector, such as shareholder voting and labor union governance. These collective choice problems are particularly problematic given levels of policy and regulatory uncertainty, competing and sometimes unclear groups of stakeholders, and rapid migration and movement across jurisdictions.

Since ancient times, societies have invented and applied technologies to facilitate collective choice. Blockchain technology is a class of distributed ledger technology—an institutional technology—that has potential application in collective choice infrastructure by creating cryptodemocracies. To be sure, technical problems remain over blockchains themselves—including their connection to the real world through identity mechanisms—but we are optimistic about the rapid advancement in this area. Cryptodemocracies involve individuals being given voting property rights that they can delegate to others using smart contracts. Just as the printing press enabled the modern secret ballot, blockchain can facilitate new institutional possibilities of democratic governance, perhaps with radically different shapes.
Our contribution in this paper is combining an understanding of the challenges in special jurisdictions with blockchain as a new frontier digital collective choice infrastructure. Existing research on special jurisdictions has comparatively analysed and measured the impact of special zones (and their policies) on economic and social development. Our focus on cryptodemocratic governance suggests a new area of comparative analysis over the collective choice mechanisms of forming and developing those different institutions. Better collective choice infrastructure enhances the capacity for the devolution of political power to smaller jurisdictions, potentially spurring greater jurisdictional competition. While we have focused on the potential impact of cryptodemocratic governance—to solve collective choice voting problems—it is worthwhile noting that these applications are just one example of the potential for blockchain technology in special jurisdictions. Blockchains are an institutional technology and can be used to provide trust in shared data, including in supply chains, tracking donations and investments, and charities. In this way blockchains can be more broadly understood as a tool to facilitate experimentation in institutional infrastructure that can help to expand investment in special jurisdictions along multiple margins, including through the reduction in corruption (see Moberg, 2015).

Our analysis of the constitutional-level knowledge and incentive problems of special zones opens a new scope of research questions. There are at least two main directions along which a new research program on the collective action governance of special jurisdictions might be pursued. First, theoretical analysis of cryptodemocratic governance as specifically applied to challenges in special jurisdictions. Some of this theoretical analysis will involve applying existing theories, including those from political science, to cryptodemocracies. Theoretical research might go further to incorporate computational simulations of the operation of cryptodemocratic infrastructure—including some of its characteristics, such as stability—and laboratory experiments to investigate how people act with a wider range of voting rights at their disposal. Second, as new cryptodemocracies are developed and applied, including specifically within a special jurisdiction context, there will likely be an expansion in empirical data. We expect a range of potential case studies to be possible once cryptodemocracies are applied in practice, shedding light on some of the more specific challenges and opportunities of developing new digital collective choice infrastructure.
REFERENCES

Acemoglu, D. (2003). Why Not a Political Coase Theorem? Social Conflict, Commitment, and Politics. *Journal of Comparative Economics*, 31, 620-652.

Acemoglu, D., & Robinson, J. (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*: Crown Business.

Akinci, G., Crittle, J., Akinci, G., & Crittle, J. (2008). *Special Economic Zones: Performance, Lessons Learned, and Implications for Zone Development*. Retrieved from Washington, DC: [http://documents.worldbank.org/curated/en/343901468330977533/Special-economic-zone-performance-lessons-learned-and-implication-for-zone-development](http://documents.worldbank.org/curated/en/343901468330977533/Special-economic-zone-performance-lessons-learned-and-implication-for-zone-development).

Allen, D. W. E. (forthcoming) Governing the Entrepreneurial Discovery of Blockchain Applications. *Journal of Entrepreneurship and Public Policy*.

Allen, D. W. E., Berg, C., & Lane, A. M. (2019). *Cryptodemocracy: How Blockchain Can Radically Expand Democratic Choice*. Lanham, US: Lexington Books.

Allen, D. W. E., Berg, C., Lane, A. M., & Potts, J. (2018). Cryptodemocracy and its Institutional Possibilities. *The Review of Austrian Economics*.

Allen, D. W. E., Berg, C., Novak, M., Markey-Towler, B., & Potts, J. (forthcoming). Blockchain and the Evolution of Institutional Technologies: Implications for Innovation Policy. *Research Policy*, 491(1).

Bell, T. W. (2017). *Your Next Government? From the Nation State to Stateless Nations*. Cambridge: Cambridge University Press.

Berg, C., Davidson, S., & Potts, J. (2019). *The Blockchain Economy: An Introduction to Institutional Cryptoeconomics*. Cheltenham: Edward Elgar.

Boettke, P. J., & Leeson, P. T. (2004). Liberalism, Socialism, and Robust Political Economy. *Journal of Markets and Morality*, 7(1), 99-111.

Bogucki, B. 2017. Buying Votes in the 21st Century: The Potential Use of Bitcoins and Blockchain Technology in Electronic Voting Reform. *Asper Review of International Business & Trade Law*, 17, 59-84.

Brennan, J. (2016). *Against Democracy*. New Jersey: Princeton University Press.

Buterin, V. (2014). An Introduction to Futarchy. *Ethereum Blog*. Retrieved from <https://blog.ethereum.org/2014/08/21/introduction-futarchy/>.

Buterin, V., Hitzig, Z., & Weyl, E.G. (2019). Liberal Radicalism: A Flexible Design for Philanthropic Matching Funds. Retrieved from: [https://ssrn.com/abstract=3243656](https://ssrn.com/abstract=3243656).

Coase, Ronald H. (1960) The Problem of Social Cost. *Journal of Law and Economics*, 3, 1-44.

Crane, G. T. (1990). *The Political Economy of China’s Special Economic Zones*. Armonk, New York and London: M.E. Sharpe.
Forthcoming in the *Journal of Special Jurisdictions*

Crane, G. T. (1994). Special Things in Special Ways: National Economic Identity and China's Special Economic Zones. *The Australian Journal of Chinese Affairs*, 32, 71-92.

Davidson, S., De Filippi, P., & Potts, J. (2018). Blockchains and the Economic Institutions of Capitalism. *Journal of Institutional Economics*, 13(4), 639-658.

Devereux, J., & Chen, L. L. (1995). Export Zones and Welfare: Another Look. *Oxford Economic Papers*, 47(4), 704-713.

Dhillon, A., Kotsialou, G., McBurney, P., & Riley, L. (2019) Introduction to Voting and the Blockchain: some open questions for economists. No. 416. Competitive Advantage in the Global Economy (CAGE).

Fenwick, A. (1984). Evaluating China's Special Economic Zones. *International Tax and Business Law*, 2, 376-397.

Flux. (2020). Flux Explained [webpage]. <https://voteflux.org/about> accessed 23 January 2020.

Geis, George S. (2018). Traceable Shares and Corporate Law. *Northwestern University Law Review*, 113(2), 227-277.

Hanson, R. (2013). Shall We Vote on Values, But Bet on Beliefs? *The Journal of Political Philosophy*, 21(2), 151-178.

Hayek, F. A. (1945). The Use of Knowledge in Society. *The American Economic Review*, 35(4), 519-530.

Hayek, F. A. (1960). *The Constitution of Liberty*. London: Routledge & Kegal Paul.

Hayek, F.A. (1973). *Law, Legislation and Liberty*. Chicago: University of Chicago Press.

IBM. (2018). Maersk and IBM to Form Joint Venture Applying Blockchain to Improve Global Trade and Digitize Supply Chains [Press release]. Retrieved from <http://www-03.ibm.com/press/us/en/pressrelease/53602.wss>.

Leeson, P. T., & Subrick, J. R. (2006). Robust Political Economy. *The Review of Austrian Economics*, 19(2-3), 107-111.

Liang, Z. (1999). Foreign Investment, Economic Growth, and Temporary Migration: The Case of Shenzhen Special Economic Zone, China. *Development and Society*, 28(1), 115-137.

Lutter, M. (2017). *The Case for Innovative Governance*. Retrieved from <https://innovativegovernance.org/wp-content/uploads/2018/03/The-Case-for-Innovative-Governance.pdf>.

Merkle, R.C. (2016). *DAOs, Democracy and Governance*. Retrieved from <https://merkle.com/papers/DAOdemocracyDraft.pdf>.

Moberg, L. (2015). The Political Economy of Special Economic Zones. *Journal of Institutional Economics*, 11(1), 167-190.
Moberg, L., & Tarko, V. (2014). Why no Chinese Miracle in Africa? Special Economic Zones and Liberalization Avalanches. Special Economic Zones and Liberalization Avalanches.

Montinola, G., Qian, Y., & Weingast, B. R. (1995). Federalism, Chinese Style: The Political Basis for Economic Success in China. World politics, 48(1), 50-81.

Morris, N. (2018). How Sovrin will prevent identity leakages like Equifax, Ledger Insights. Retrieved from <https://www.ledgerinsights.com/sovrin-hyperledger-indy-blockchain-identity-equifax/>.

Nakamoto, S. (2008). Bitcoin: A Peer-to-peer Electronic Cash System. Retrieved from <https://bitcoin.org/bitcoin.pdf>.

Pennington, M. (2011). Robust Political Economy. Policy: A Journal of Public Policy and Ideas, 27(4), 8-11.

Posner, Eric A., & Weyl, E. G. (2015) Voting squared: Quadratic voting in democratic politics. Vanderbilt Law Review, 68, 441-500.

Salter, A., (2018) Sovereign entrepreneurship. Journal of Entrepreneurship and Public Policy, 7(4), 411-427.

Tabarrok, A. (1998). The private provision of public goods via dominant assurance contracts. Public Choice, 96(3-4), 345-362.

Van Rijmenam, M., and Ryan, P. (2019) Blockchain: Transforming Your Business and Our World. London: Routledge.

Wang, J. (2013). The Economic Impact of Special Economic Zones: Evidence from Chinese Municipalities. Journal of Development Economics, 101, 133-147.

Werbach, K. (2018). The Blockchain and the New Architecture of Trust. Cambridge, MA: MIT Press.

Yeung, Y.-m., Lee, J., & Kee, G. (2009). China's Special Economic Zones at 30. Eurasian Geography and Economics, 50(2), 222-240.