

**UNBLOCKING BLOCKCHAIN FROM ANTITRUST UNCERTAINTY: AN INDIAN
PERSPECTIVE**

- *MS. AMRUTHA ALAPATI AND MS. AVANI LAAD**

ABSTRACT

Blockchain technology is the new revolution in business systems around the globe and has changed the way information is exchanged. It has the potential for changing the way economic systems function and its use over the next few decades has been predicted to be as universal as that of the internet today.

Blockchain has many characteristics that differentiate it from traditional information-sharing systems including decentralisation, immutability and pseudonymity. Given its commercial importance and unique nature, it is relevant to examine blockchain through the antitrust lens for the possible pro or anti-competitive implications.

There are three prominent issues in the blockchain antitrust crossover from the Indian competition law perspective. The Competition Act, 2002 [“the Act”] may not completely apply to blockchain because of the restricted definitions of ‘agreement’, ‘enterprise’ and ‘collusive behaviour’. Blockchain also creates opportunities for collusion and abuse of dominance and the traditional solutions to such behaviour are inadequate.

In the course of analysis, the inefficiencies of traditional competition law in regulating blockchain technology are highlighted and corresponding methods to resolve them are suggested including the notion of “Law is Code ” in combination with targeted advocacy.

* Ms. Amrutha Alapati and Ms. Avani Laad are 4th Year Students of B.B.A.,LL.B.(Hons.) at Symbiosis Law School, Pune.

I. INTRODUCTION

The latest buzzwords in technological and legal development are “blockchain” and “cryptocurrency”. This is largely due to their impact on existing technologies and the way that information is stored and transmitted. Blockchain technology is poised to take over the future of data-sharing in the form of Web3. This global expansion will be aided by the rise of the Metaverse and the digital economy. Experts say that by the end of 2030, blockchain technology may potentially form the building block for 30% of customer usage worldwide. It may also bring in business worth over \$176 billion by the year 2025.¹²⁵ These facts are proof of the undiscovered potential of blockchain technology. Therefore, it is of no surprise that the regulation of this technology under existing areas of law is dominating legal discussion and inquiry. One such area is that of competition law.

Blockchain has presented a variety of new and interesting challenges to the existing investigative approach of the Competition Commission of India (CCI) and defies some of the basic definitions of anti-competitive actions such as ‘agreement’, ‘enterprise’, and ‘collusive behaviour’. Therefore, it is important to take a closer look at the existing legal provisions of the Act and the case laws of the CCI to look at blockchain through this new lens. It is important for all the stakeholders to understand the legal threats of competition to devise solutions and prevent anti-competitive behaviour.

In this article, the authors aim and endeavour to resolve the competition law questions that have been raised over blockchain technology. Primarily, this article involves a basic background to blockchain technology, which uses a chain of blocks to sequentially arrange and store data securely. There are two types of blockchains i.e. public and private. Next, the applicability of competition law to blockchain technology is segmented over a discussion of the definitions and terms such as ‘agreement’, ‘enterprise’, and ‘collusive behaviour’ that are relevant to the CCI’s approach to antitrust issues. This is done through an analysis of the possible vertical agreements, horizontal agreements and smart contracts that could possibly be entered into in the domain of blockchain technology. Lastly, the two main competition law issues of ‘collusion’ and ‘abuse of dominance’ and their possible occurrence and resolution in the ‘relevant market’ are analysed.

¹²⁵ ‘Blockchain Tech Is the Future’ *Hindu Business Line* (20 December 2021) <<https://www.thehindubusinessline.com/opinion/blockchain-tech-is-the-future/article37999487.ece#:~:text=By%202030%2C%20it%20could%20be,simply%20shows%20the%20unfolding%20potential>> accessed 13 March 2022.

Given the growing importance of blockchain technology, there is a need to identify all possible adverse effects on competition in order to realise the objects of competition law and curb anti-competitive behaviour.

II. BACKGROUND TO BLOCKCHAIN

A. What are Blockchains

Blockchain is a technology involving, as the name suggests, a chain of blocks containing information which are arranged sequentially and stored in a decentralized and distributed ledger.¹²⁶ Thus, on a blockchain, the transactions are recorded and stored across a number of different nodes (or computers) in the network. Blockchain allows its users to interact with each other by way of peer-to-peer transmission and has a number of relevant basic characteristics.

A blockchain is decentralized, meaning that there is no central power or authority controlling it and every addition of a new block to the chain requires the consensus of all users. *Decentralization* prevents the control of a blockchain from being concentrated in any single entity and thus makes it more secure and democratic. Further, every user on the blockchain is identified by way of a unique public address, as opposed to their real identities, and thus, a blockchain is *pseudonymous*. Transactions carried out on the blockchain are *immutable*,¹²⁷ meaning that they cannot be altered or deleted and shall be stored on the ledger as a permanent record. Therefore, decentralization, pseudonymity and immutability are the three unique and essential characteristics of a blockchain that may affect the way antitrust law is applied to the technology.

B. Types of Blockchains

Blockchains can be broadly classified into two categories: public and private

i. Public Blockchains:

These blockchains have open access and are hence free for all masses to join. They do not require any person to take prior permission to participate in the blockchain.¹²⁸ Bitcoin is an example of a

¹²⁶ Satoshi Nakamoto, 'Bitcoin: A Peer-to-Peer Electronic Cash System' (White Paper, 31 October 2008).

¹²⁷ Toshendra Kumar Sharma, 'How Data Immutability Works in Blockchain?' (Blockchain Council) <<https://www.blockchaincouncil.org/blockchain/data-immutability-works-blockchain>> accessed 5 January 2022.

¹²⁸ Toshendra Kumar Sharma, 'Public vs. Private Blockchain: A Comprehensive Comparison' (Blockchain Council) <<https://www.blockchain-council.org/blockchain/public-vs-private-blockchain-a-comprehensive-comparison/>> accessed 5 January 2022.

public blockchain network. In such networks, all participants can see and access the ledger, and any change or modification in the blockchain would require consensus from all participants.¹²⁹ The consensus mechanism usually followed by public blockchains is proof of work, wherein miners, who are certain participants of the blockchain, compete in order to solve a hashing algorithm, which allows them to verify a transaction.¹³⁰ They are further rewarded for contributing their computational power by way of a transaction fee. Thus, the entities or persons associated with a public blockchain can be divided into *users*, *miners* and *developers*.

ii. Private Blockchain:

A private or permissioned blockchain is not open to all and its access can only be gained by obtaining permission. In such networks, the control of the blockchain lies with one or more trusted entities or intermediaries.¹³¹ Unlike public blockchains, parties to a transaction in a private blockchain would be the only ones having knowledge of and access to it.¹³² Consequently, a private blockchain is more centralized in comparison to a public blockchain. Moreover, the consensus mechanisms employed in public blockchains, such as proof of work, are not generally used in private blockchains.¹³³ Hyperledger Fabric by the Linux Foundation is one example of a private blockchain.¹³⁴

III. APPLICABILITY OF INDIAN COMPETITION LAW TO BLOCKCHAIN

A. Agreement under Blockchain – Whether Mere Participation is Agreement?

In cases of anti-competitive agreements, one of the first tests by the CCI is to evaluate the existence of an agreement – whether horizontal, vertical or conglomerate. The Act defines

¹²⁹ A.R Sai et al., 'Taxonomy of Centralization in Public Blockchain Systems: A Systematic Literature Review', (2021) 58(4) Inf. Process. Manage. 102584, 2.

¹³⁰ Laura Gargolinski Jaeger, 'Public versus private: What to know before getting started with blockchain' (IBM) <https://www.ibm.com/blogs/blockchain/2018/10/public-versus-private-what-to-know-before-getting-started-with-blockchain/><https://www.ibm.com/blogs/blockchain/2018/10/public-versus-private-what-to-know-before-getting-started-with-blockchain/> accessed 30 May 2022.

¹³¹ Private Blockchains (Bird & Bird X) <<https://www.twobirds.com/~media/pdfs/in-focus/blockchain/private-blockchain-briefing-note.pdf>> accessed 5 January 2022.

¹³² Toshendra Kumar Sharma, 'Public vs. Private Blockchain: A Comprehensive Comparison' (Blockchain Council) <<https://www.blockchain-council.org/blockchain/public-vs-private-blockchain-a-comprehensive-comparison/>> accessed 5 January 2022.

¹³³ Dr. Thibault Schrepel, 'Is Blockchain the Death of Antitrust Law? The Blockchain Antitrust Paradox', (2019) 3 Geo. L. Tech. Rev. 281, 293.

¹³⁴ What is Hyperledger Fabric (IBM) <<https://www.ibm.com/topics/hyperledger>> accessed 5 January 2022.

“agreement” as “any arrangement or understanding or action in concert”.¹³⁵ Thus, it does not matter whether the said agreement is written or legally enforceable.¹³⁶ Merely entering into an agreement is actionable. So, the question with blockchain that arises is whether mere participation can be deemed as agreement as there may not be any other method to determine, for instance, collusion in the sharing of sensitive information, etc. An interpretation of the definition certainly suggests that an agreement to participate according to the rules of a blockchain or mere participation in the blockchain would amount to an agreement.

The question of “mere participation” as liability for anti-competitive conduct was decided in the case of a trade union by the CCI in the affirmative.¹³⁷ However, this position has not been tested against the existence of an agreement.

Other jurisdictions, such as Singapore, have explored the connotations of “mere participation” in anti-competitive agreements and come down heavily on such conduct. The Competition Commission of Singapore (CCS) in *Pest Control Services*¹³⁸ held that merely entering into an anti-competitive agreement regardless of intent to execute is a violation of competition law. In *Employment Agencies*,¹³⁹ the CCS stated that without an express declaration of non-participation, there is tacit approval which is tantamount to a violation. In the *Electrical Works*¹⁴⁰ case, the CCS for the first time allowed a member of the cartel, which was the whistle-blower, to avail full immunity provided that it was not the mastermind or did not pressurise the other members to join.¹⁴¹

B. Blockchain as an Enterprise

The next hurdle in evaluating blockchain technology under competition law is to assess whether it can be classified as a “dominant enterprise”. The difficulty lies in the fact that there is no single entity. Rather, multiple entities participate at different points and are involved in the decision-making. It is a decentralised mechanism. One answer to this is to evaluate their actions under the

¹³⁵ Competition Act 2002, s 2(b).

¹³⁶ *CCI v Coordination Committee of Artistes & Technicians of W.B. Film & Television*, (2017) 5 SCC 17; *Rajasthan Cylinders & Containers Ltd. v Union of India*, (2020) 16 SCC 615.

¹³⁷ *T.G. Vinayakumar v Association of Malayalam Movie Artists and Ors*, 2017 CompLR 303 (CCI).

¹³⁸ *Collusive Tendering (Bid-rigging) for Termite Treatment/Control Services by Certain Pest Control Operators in Singapore*, CCS 600/008/06 (9 January 2008).

¹³⁹ *Fixing of Monthly Salaries of New Indonesian Foreign Domestic Workers in Singapore*, CCS 500/001/11 (30 September 2011) (“Employment Agencies”).

¹⁴⁰ *Collusive Tendering (Bid-rigging) in Electrical and Building Works*, CCS 500/001/09 (4 June 2010).

¹⁴¹ *Competition Law* (2012) 13 SAL AnnRev 153, 159.

concept of “collective dominance”, recognised in the jurisdictions of the UK, the European Union and Singapore. Section 47 of the Singapore Competition Act, 2004, states that ‘any conduct on the part of one or more undertakings which amounts to the abuse of a dominant position in any market in Singapore is prohibited’. Similarly, Article 102 of the Treaty on the Functioning of the European Union (“TFEU”) and Section 18 of the Competition Act, 1998, recognise the abuse of dominant position by ‘one or more undertakings’. However, this concept is not yet recognised in India and thus does not add much to the discussion.¹⁴² The definition of ‘enterprise’ under the Act, however, sheds some light.

The Act defines an enterprise as “a person or a department of the Government...”¹⁴³ and a “person” to include, among others, “an association of persons or a body of individuals, whether incorporated or not, in India or outside India”.¹⁴⁴ Thus, a blockchain application may be taken as an enterprise involved in the provision of the service of distributed ledger technology (DLT) under the scheme of the Act.

IV. ANTI-COMPETITIVE AGREEMENTS VIS-À-VIS BLOCKCHAIN

A. Opportunities for Collusion

The first anti-trust blockchain case was over collusion. The US District Court in *United American Corp v. Bitmain Inc.*, is currently hearing claims of collusion among the miners and investors of two rival Bitcoin forks that had an adverse effect on competition in the crypto market and led to mining wars. It is all set to become a landmark judgment that agencies will look to in future.¹⁴⁵

i. Horizontal Agreements

One form of collusion is horizontal agreements wherein parties engaged in the same industry or business are involved in cartelisation or bid-rigging. Competitors may be a part of the same blockchain application for the sake of efficiency, for the creation of a new market or for

¹⁴² *Fast Track Call Cab (P) Ltd. v ANI Technologies (P) Ltd.*, 2017 SCC OnLine CCI 36; *Meru Travel Solutions (P) Ltd. v ANI Technologies (P) Ltd.*, 2018 SCC OnLine CCI 46; *Samir Agarwal v CCI* (Cab Aggregators Case), (2021) 3 SCC 136.

¹⁴³ Competition Act 2002, s 2(h).

¹⁴⁴ Competition Act 2002, s 2(l).

¹⁴⁵ Konstantinos Stylianou, ‘What can the first blockchain antitrust case teach us about the crypto-economy?’ (2019) Jolt Digest Harv. J.L. Tech. < <http://jolt.law.harvard.edu/digest/what-can-the-first-blockchain-antitrust-case-teach-us-about-the-crypto-economy>> accessed 28 January 2022.

improving current processes. However, in certain cases, blockchain applications can also alter the gains and challenges associated with maintaining a collusive agreement. The essential for determining the existence of a collusive agreement is to check if the parties to it have the capacity to do any of the following:

- (i) Interact with each other and arrive at a mutually agreeable coordination strategy;
- (ii) Monitor each other's conduct to ensure adherence to the agreement;
- (iii) Penalise a party in case of non-adherence to the agreement such that the penalty exceeds any possible benefits from the non-adherence.

ii. Exchange of Sensitive Information – An Enabler of Collusion?

One of the main reasons for the growing popularity of blockchain is its immutability and transparency. It engenders trust and facilitates the transfer and storage of large amounts of data. The common assumption is that transparency of data would intensify competition. However, this may not be true in all cases. There is a possibility that information belonging to competitors may be visible on a shared blockchain. Unless sufficient safety measures are included, the information in the ledger can be easily viewed by the blockchain participants, which is termed as the “*visibility effect*”. However, the same information may not be accessible to entities outside the blockchain, termed as the “*opacity effect*”, due to restricted access in case of a permissioned consortium blockchain or encrypted data with pseudonyms in case of a permissionless public blockchain.¹⁴⁶ Adequate safeguards should be put in place to ensure that this feature does not enable competitors to arrive at an agreement and monitor each other's conduct. However, it is important to consider whether there is any difference that blockchain applications create for information exchange vis-à-vis other existing systems in cases of physical or digital exchange of information.

One difference may be that through a blockchain, information can be exchanged on a near real-time basis. Additionally, there may be greater trust in the authenticity of the data stored in a blockchain than in other systems, due to the secure and immutable nature of blockchains.

iii. Vertical agreements

¹⁴⁶ Competition Commission of India, ‘Discussion Paper on Blockchain Technology and Competition’ (2021) 43 <https://www.cci.gov.in/sites/default/files/whats_newdocument/Blockchain.pdf.> accessed 6 January 2022.

Agreements for anti-competitive objects entered into between businesses operating at different stages of the supply chain are known as vertical agreements. They may be in the form of tying-in, for exclusive supply or distribution of goods, services or raw materials, refusal to deal, and for resale price maintenance as per Section 3(4) of the Act.¹⁴⁷ Using blockchain technology, vertical agreements could be entered into by a blockchain for the following objects:

- (i) Barring access to any entity using a competing blockchain or payment wallet;
- (ii) Restricting developers from dealing with any competing platform;
- (iii) Tying the sale of a mining hardware provider's product to a miner through an agreed wallet;
- (iv) Barring a blockchain's wallet, nodes or exchange from partnering with competing blockchain applications;
- (v) Smart contracts that self-enforce tie-in, exclusive supply/distribution, refusal to deal, or minimum resale price maintenance between entities at different levels of the supply chain.

Thus, the above vertical agreements have the potential to create an adverse effect on competition. Assessing the anti-competitiveness of such agreements would have to be made on a case-to-case basis. The anti-competitive effect of such agreements would have to be set off against the justifications supplied for entering into them.

There is a higher probability of vertical anti-competitive agreements occurring in permissioned consortium blockchains than in permission-less public blockchains. If a public blockchain enters into a refusal-to-deal agreement, its rules would have to be modified, which would require the nodes to be in agreement.¹⁴⁸ Further, any such change in a public permissionless blockchain protocol would imply that it is no longer "permission-less" and "public". Whereas, in a permissioned consortium blockchain, nodes can change their governance rules to engage in such conduct by not permitting an entity from reading the information on the blockchain or/and restricting them from proposing new transactions or/and forbidding them from verifying transactions.¹⁴⁹

¹⁴⁷ Competition Act 2002, s 3(4).

¹⁴⁸ I. Lianos, 'Blockchain Competition - Gaining Competitive Advantage in the Digital Economy: Competition Law Implications' (2018) Centre for Law Economics and Society UCL vol. 8.

¹⁴⁹ Dr. Thibault Schrepel, 'Is Blockchain the Death of Antitrust Law? The Blockchain Antitrust Paradox', (2019) 3 Geo. L. Tech. Rev. 289.

Similarly, in a public blockchain, since the data is public, there is no incentive for the blockchain application to impose an exclusive dealing condition for the publishing of blocks. Further, once the block is published in a public blockchain, the node also has no incentive to publish it in another public blockchain given the costs involved. However, in a permissioned blockchain, dealing exclusively may be appealing to a blockchain application if it wishes to be the only source for data on a transaction i.e., being the sole source of data may increase the attractiveness of the blockchain.¹⁵⁰

B. Smart contracts

Smart contracts are agreements that are executed by automation i.e., code is written onto a blockchain so that when specific conditions are met, certain actions are automatically performed. For example, making a payment, sending notifications to parties, or issuing tickets. Parties must first agree on “if/when/then” conditions to determine when a certain action must occur during the transaction and possible exceptions if any. A developer can then write the code. A network of computers executes the transaction, which cannot be altered, and the results can only be viewed by parties with access. Therefore, smart contracts can reduce paperwork, increase the speed and efficiency of transactions, and result in greater transparency and trust between parties.¹⁵¹

With the advent of 5G, the Internet of Things and AI, smart contracts would play an important role in the world of technology and commerce by creating new products and services. However, smart contracts in a few cases could be used to enforce and maintain collusive agreements without the need for extensive information exchange. One way to do this would be for competitors to use smart contracts to self-enforce collusion using code and pricing algorithms in line with the collusive agreement.¹⁵² Further, smart contracts could be misused to self-execute punishment on a co-conspirator who deviates from the terms of the collusive agreement.

For instance, a smart contract may be used to create a fund with contributions from each firm. When one of the firms deviates from the agreed price or output levels by lowering their price or increasing their output, a smart contract may result in automatic forfeiture of the amount and its distribution among the other firms. If the punishment is to carry a deterrent weight, the loss that

¹⁵⁰ *ibid.*

¹⁵¹ What are smart contracts on blockchain? (IBM) < <https://www.ibm.com/topics/smart-contracts> > accessed 1 June 2022.

¹⁵² I. Lianos, ‘Blockchain Competition - Gaining Competitive Advantage in the Digital Economy: Competition Law Implications’ (2018) Centre for Law Economics and Society UCL vol. 8.

would occur from this punishment must be greater than the profit made from violating the collusive agreement. If the loss to the deviator from the forfeiture of funds exceeds the benefit from deviation, the smart contract could act as deterrence to deviation and thereby facilitate collusion. If firms use smart contracts to engage in collusive conduct, then they would be acting in contravention of the Act.¹⁵³

V. ABUSE OF DOMINANCE VIS-À-VIS BLOCKCHAIN

As blockchain gains prominence, it is inevitable that concerns pertaining to abuse of dominance over and by blockchains would also emerge. However, these considerations are premised on the overarching question of whether dominance can be established on blockchains at all, and the persons on whom the liability, if any, would fall, in light of the decentralized and pseudonymous nature of blockchains. The relevant provision regulating abuse of dominance under the Act is Section 4, where an enterprise is prohibited from abusing its dominant position,¹⁵⁴ with a “dominant position” being defined as a position of strength in the relevant market.¹⁵⁵ Thus, the first challenge in ascertaining liability in such cases is the delineation of the “relevant market”. The second challenge is the characterization of “*dominance*” itself, and its determinative factors given the unique technicalities of blockchain. This is similar to the challenges posed in ascertaining dominance in digital markets, as blockchain too, is digital innovation. The third challenge emerges in analysing the effects of dominance, and whether a firm is engaging in unilateral anti-competitive practices through its dominant standing. Here, the different anti-competitive practices that can be carried out on and through blockchains are pertinent.

A. Delineation of Relevant Market

To ascertain if an entity has dominance, it is imperative to first determine the boundaries under which such alleged dominance might be present, constituted as the “relevant market”. Under the Act, the relevant market is determined in terms of the relevant product and geographic market.¹⁵⁶ A relevant product market consists of products or services regarded as interchangeable or substitutable by consumers¹⁵⁷ while a relevant geographic market comprises an area where there

¹⁵³ Competition Commission of India, ‘Discussion Paper on Blockchain Technology and Competition’ (2021) 36-46 <https://www.cci.gov.in/sites/default/files/whats_newdocument/Blockchain.pdf> accessed 6 January 2022.

¹⁵⁴ Competition Act 2002, s 4(1).

¹⁵⁵ Competition Act 2002, s 4.

¹⁵⁶ Competition Act 2002, s 2(r).

¹⁵⁷ Competition Act 2002, s 2(t).

is distinct homogeneity of competitive conditions as regards a product or service, as compared to neighbouring areas.¹⁵⁸

The traditional methods and rules of determining relevant markets may correspondingly also be applied to blockchain applications, by assessing the substitutability of the application with other blockchain or non-blockchain applications. Thus, as enumerated by the CCI in its discussion paper, the relevant market can be defined in three ways.¹⁵⁹ *Firstly*, where the blockchain application does not have any close substitutes, in the form of other similar blockchain or non-blockchain applications, then the application itself would constitute a single relevant market. *Secondly*, the relevant market may consist of a number of blockchain applications providing substitutable services or products, but without any non-blockchain applications. *Thirdly*, the relevant market may consist of a number of substitutable blockchain as well as non-blockchain applications, being either digital or non-digital. This approach is similar to the one utilized when regarding online and offline sales as part of the same relevant market.¹⁶⁰

It is important to note that a relevant market in the case of blockchain can be determined on the basis of the type of applications running on it, but not the blockchain as a whole. This is because a single blockchain may host a plethora of different applications, and thus, have different products or services hosted on it. Since a relevant market has to be determined on the basis of substitutability or interchangeability of such products or services, the blockchain platform and the applications thereon might fall under distinct relevant markets.

The pseudonymous nature of blockchains poses a difficulty when it comes to ascertaining the relevant geographical market, as the identity or location of the participants of the blockchain would not be accessible.¹⁶¹ Moreover, a blockchain might itself also be transnational, which further adds to the difficulty. It is especially complex, hence, to evaluate the relevant geographical market in the case of blockchains, so long as the problem posed by pseudonymity of users on a blockchain persists. Without clarifying the geographic dimension of a relevant market, it would not be possible to carry out an accurate dominance analysis as it could be that some blockchain

¹⁵⁸ Competition Act 2002, s 2(s).

¹⁵⁹ Competition Commission of India, 'Discussion Paper on Blockchain Technology and Competition' (2021) 41 <https://www.cci.gov.in/sites/default/files/whats_newdocument/Blockchain.pdf> accessed 6 January 2022.

¹⁶⁰ Dr. Thibault Schrepel, 'Is Blockchain the Death of Antitrust Law? The Blockchain Antitrust Paradox', (2019) 3 Geo. L. Tech. Rev. 304.

¹⁶¹ Competition Commission of India, 'Discussion Paper on Blockchain Technology and Competition' (2021) 41 <https://www.cci.gov.in/sites/default/files/whats_newdocument/Blockchain.pdf> accessed 6 January 2022.

applications might only be concerned with particular geography and do not compete with the application in assessment. Thus, the inability to determine the relevant geographic market is a huge challenge for competition law agencies that directly relates to a specific and essential feature of blockchain technology.

B. Determining Dominant Position – The Relevant Elements

Assuming the relevant market has been delineated, the next step would involve evaluating the strength of a particular entity in that market in order to ascertain its dominance. In this regard, Section 19(4) of the Act lays down a number of factors for inquiring into the dominant position of an enterprise, including its market share, size and resources, economic power, the dependence of consumers, etc.¹⁶² The CCI's decisional practice has shown that market share has invariably been one of the first factors relied on by it for ascertaining dominance.¹⁶³

However, when it comes to blockchain, it is difficult to identify the factors that may be used in assessing market power, especially between blockchain applications that compete with each other.¹⁶⁴ This means that the relevant elements for determining market share in the case of blockchain applications might differ from that of brick and mortar. Some factors that may be relied on include the number of users, the number of transactions taking place on the blockchain applications, the revenues generated, etc. However, the value of revenue may itself pose its own difficulties, as, on the blockchain, revenue is generated through tokens, whose value itself may be volatile and fluctuating.¹⁶⁵ Other factors include *inter alia*, the respective market powers of the underlying participants and the data held by the blockchain application. Data has also recently been recognized as a form of non-price competition by the CCI,¹⁶⁶ and in the recent *suo-moto* investigation against WhatsApp, the CCI observed that data can be a factor influencing the market power of an enterprise.¹⁶⁷

Thus, depending upon the facts of a particular case, different factors or combinations thereof might be relied upon to assess market power. Like digital markets, network effects may also be

¹⁶² Competition Act 2002, s 19(4).

¹⁶³ Abir Roy, 'Competition Law in India: A Practical Guide' (Kluwer Law International 2016) 168.

¹⁶⁴ Dr. Thibault Schrepel, 'Is Blockchain the Death of Antitrust Law? The Blockchain Antitrust Paradox', (2019) 3 Geo. L. Tech. Rev. 305.

¹⁶⁵ *ibid*.

¹⁶⁶ Competition Commission of India, 'Market Study on the Telecom Sector in India' (2021) 29.

¹⁶⁷ *In Re: Updated Terms of Service and Privacy Policy for WhatsApp Users*, *Suo Moto Case No. 01 of 2021*.

taken into consideration when determining dominance. Further, on similar lines, specific to blockchains is also the “*token effect*” wherein blockchain, by use of tokens, incentivizes masses to join it quickly, before the token value increases further.¹⁶⁸

C. Abusive Practices Through Blockchain

Dominance by itself is not contrary to the Act; only its abuse is.¹⁶⁹ Therefore, once the dominant strength of an enterprise has been established, it becomes imperative to see whether any abusive conduct has been affected by the dominant entity. It is not necessary that the abusive conduct have any link with the market power of the entity; so long as the conduct is by an enterprise in dominance, it would violate the Act.

i. Exclusionary, Discriminatory and Exploitative Practices

The biggest exclusionary conduct that is likely to be performed through private permissioned blockchains is the refusal of access of the blockchain to others. This conduct cannot be carried out on a public blockchain as the access therein is free to all. However, the high likelihood of such conduct in a private blockchain makes this a relevant consideration, especially with the advent of blockchain consortia, wherein the members of the consortia may refuse access to new entrants.¹⁷⁰ Refusal of access becomes an exclusionary practice in the circumstance where the usage of the blockchain becomes an “*essential facility*” for competing in the market.¹⁷¹ For example, it could be that the usage of blockchain technology has allowed the members of the consortium to gain access to certain data which gives them a competitive edge and has significantly reduced their costs, thereby allowing them to provide services at a lower cost. In such a situation, access to the blockchain becomes essential for a new entrant to compete in the market, and refusal of access would amount to imposing barriers to entry for such prospective entrants.

¹⁶⁸ Dr. Thibault Schrepel, ‘Is Blockchain the Death of Antitrust Law? The Blockchain Antitrust Paradox’, (2019) 3 Geo. L. Tech. Rev. 296.

¹⁶⁹ Competition Commission of India, ‘Provisions Relating to Abuse of Dominance’, (Advocacy Series 4) 7.

¹⁷⁰ Primavera De Filippi & Aaron Wright, ‘Blockchain And The Law: The Rule Of Code’ (Harvard University Press 2018) 31.

¹⁷¹ Competition Commission of India, ‘Discussion Paper on Blockchain Technology and Competition’ (2021) 43 <https://www.cci.gov.in/sites/default/files/whats_newdocument/Blockchain.pdf.> accessed 6 January 2022.

Apart from the actual refusal of access, constructive refusal occurs wherein access to the blockchain may be allowed to a competitor but the requisite information or data has not been made accessible to it, or where the cost of access to the blockchain is very high for the new entrant to be able to afford.¹⁷² The CCI discussed the essential facility doctrine in the case of *Arshiya Infrastructure v. Ministry of Railway*, wherein it held that the doctrine can only be invoked in situations where there is technical feasibility for providing access, where lack of access would lead to a distinct possibility of lack of effective competition, and where it is possible to provide access on reasonable terms.¹⁷³ Hence, refusal of access to a permissioned blockchain is in contravention of competition law in the situation where it constitutes an essential facility for competition, and where the refusal is unjustified. In such situations, the dominant enterprise or consortia may be asked to provide access to the blockchain on fair, reasonable and non-discriminatory (FRAND) terms, as is also the practice in cases of refusal of licensing of standard essential patents.¹⁷⁴

Apart from the refusal of access, another exclusionary practice possible through blockchains is tying, wherein the sale of a product or service is made subject to the purchase of other products or services or other obligations. These practices once again are unlikely to be carried out on a public blockchain, as access to such blockchains is free. However, private blockchains may greatly make use of tying as a way to gain more profits by tying access to the blockchain with other obligations.¹⁷⁵

Exclusionary abuse of dominance may also be carried out through predation, including predatory innovation. Predatory innovation can be defined as a practice, wherein innovation is implemented solely for achieving anti-competitive purposes, and which does not benefit the consumer in any way.¹⁷⁶ For instance, a new version or up-gradation to technology might be carried out under the guise of ‘innovation’ while the true purpose behind such up-gradation was actually to eliminate competition. As opposed to public blockchains, where every change requires the approval of all the users and any modifications so made are traceable, predatory innovation is highly likely in private blockchains. In private blockchains, it is relatively easier to adopt modifications and changes, without requiring the prior approval of users. Further, it is much faster to make changes

¹⁷² *ibid.*

¹⁷³ *Arshiya Infrastructure v. Ministry of Railway*, Case No. 64 of 2010.

¹⁷⁴ Dr. Thibault Schrepel, ‘Blockchain + Antitrust’ (Elgar Online 2021) 196.

¹⁷⁵ *ibid* 197.

¹⁷⁶ Dr. Thibault Schrepel, ‘Predatory Innovation: The Definite Need for Legal Recognition’ (2018) 21 *Smu Sci. & Tech. L. Rev.* 19, 22.

to the code of a blockchain, without raising any additional costs. Moreover, in private blockchains, such modifications may even be invisible to the other users. Thus, there is a dire need for legal measures to be implemented in order to tackle the practice of predatory innovation. Other abusive or exclusionary conduct that can be facilitated through blockchains is *inter alia*, predatory pricing and margin squeeze.¹⁷⁷ Private blockchains may also facilitate discriminatory abuses. Such practices involve imposing different conditions when trading with different parties.¹⁷⁸ For instance, under price discrimination, different prices might be charged for the same product from different parties, or a particular party may be charged the same price for different products. Similarly, in blockchain, different transaction fees might be charged to different users. The visibility effect prevents price discrimination from being carried out in a public blockchain; however, users of a private blockchain might be prone to the imposition of discriminatory terms.

ii. Abusive Conduct and the Visibility Effect

From the foregoing analysis, it has been evident that the likelihood of anti-competitive practices is quite less when the blockchain in question is a public blockchain. This is attributed to what has been coined as the “*visibility effect*”.¹⁷⁹ The visibility effect implies that all transactions and actions of the users of a public blockchain are open and visible to all. The consequent transparency is said to create a check on users of public blockchains so that they do not engage in anti-competitive practices. In contrast, private blockchains lack this transparency, as their access is not open to all, the governance does not require approval of all users, and it is much easier to control as regards the information visible to each user. Thus, private blockchains may be misused and exhibit greater anti-competitive conduct. Consequently, there is a need for keeping a check on the activities of a private blockchain, in order to prevent them from engaging in such practices.

VI. WHOSE POWER AND WHOSE LIABILITY?

A pertinent issue in an inquiry of antitrust vis-à-vis blockchain is the decentralized nature of blockchain and its legal nature. Competition law applies to distinct enterprises; however, since a blockchain is decentralized among its users, it is difficult to understand who the dominant entity

¹⁷⁷ Pike, C, and A. Capobianco, ‘Antitrust and the trust machine’ (OECD, 2020) 10 <<https://www.oecd.org/daf/competition/antitrust-and-the-trust-machine-2020.pdf>> accessed 12 January 2022.

¹⁷⁸ Competition Act 2002, s 4(2)(a).

¹⁷⁹ Dr. Thibault Schrepel, ‘Is Blockchain the Death of Antitrust Law? The Blockchain Antitrust Paradox’, (2019) 3 Geo. L. Tech. Rev. 308.

in question would even be in the first place. It becomes even more difficult in light of the fact that collective dominance as a legal concept is not yet recognized by Indian competition law. Moreover, it can be argued that the very notion of market power under competition law is premised on there being a 'central' power, which is not the case under blockchain, being free of central power and founded upon decentralized decision-making. Closely connected to this issue is also the issue of liability, when dominance is presumed to have been found. Whether any unilateral anti-competitive practice on a blockchain would lead to the liability of all its users or only the creators of the blockchain? This directly relates to the problem of the legal characterization of a blockchain. Even if the blockchain is treated as an association of persons for the purpose of the Act, it would mean an unlimited liability of all the participants of the blockchain, despite the unfair practice only being attributed to a fraction of users unknown and unrelated to them. This further disincentivises them from participating in a blockchain. Hence, decentralization makes it difficult to determine and trace the legal nature of blockchains and thereby the liability of the responsible entities.

Another concern is the lack of a human element in blockchain technology, which seems to be a prerequisite for liability under the Act, pursuant to the case of *Samir Agarwal v. ANI Technologies*.¹⁸⁰ In this case, the CCI held that when prices are being determined algorithmically, it would not amount to collusion or cartelization. Accordingly, where the abuse of dominance is also being exercised by virtue of blockchain algorithms, the question of liability becomes more complex.

VII. IMPLICATIONS ON CRYPTOCURRENCY

Cryptocurrency is one of the most prevalent applications of blockchain technology today. The first anti-trust blockchain case in the US¹⁸¹ is a testament to the anti-competitive issues that can arise in a blockchain technology resulting in its misuse. Given the existing concerns of cryptocurrency being used for fraud, money laundering,¹⁸² terror financing,¹⁸³ causing monetary

¹⁸⁰ *Samir Agarwal v. ANI Technologies*, Case No. 37 of 2018.

¹⁸¹ 'United American Corporation v. Bitmain Inc.', (2018) Case No. 1-18-cv-25106 (S.D. Fla.).

¹⁸² 'Government concerned over crypto use for laundering, terror' Times of India (New Delhi, 14 Nov 2021) <<https://timesofindia.indiatimes.com/india/government-concerned-over-crypto-use-for-laundering-terror/articleshow/87691627.cms>>.

¹⁸³ 'Cryptocurrencies could be misused for terror funding, says Nirmala Sitharaman at IMF meeting' Scroll.in (New Delhi, 19 April 2022) <<https://scroll.in/latest/1022156/cryptocurrencies-can-be-misused-for-terror-funding-says-nirmala-sitharaman-at-imf-meeting>>.

instability, etc. in India, any possible indication of collusion through blockchain could influence Indian drafters.

The Indian legislature has been mulling a complete ban on cryptocurrency in India since 2018 and more recently with the Cryptocurrency and Regulation of Official Digital Currency Bill, 2021.¹⁸⁴ However, under the Finance Act, 2022, a new tax levy has been introduced against cryptocurrency¹⁸⁵ which may showcase an intention to regulate cryptocurrency instead of imposing a complete ban. Currently, India is finalising its consultation paper on cryptocurrencies with inputs from the World Bank, International Monetary Fund (IMF) and other stakeholders.¹⁸⁶ The competition advocacy initiatives suggested by CCI in relation to the blockchain¹⁸⁷ is another instance of efforts taken to regulate crypto by overcoming the anti-competitive effects of blockchain.

VIII. SUGGESTIONS AND CONCLUSION

Blockchain technology and Indian competition law, both being in their nascent stages, pose difficulties when it comes to their interplay. Nonetheless, it is inevitable that these two domains do and would continue to intersect, as anti-competitive concerns are likely to be raised even through the use of blockchain. Moreover, being a breakthrough technology, blockchain has the potential to significantly impact the way transactions would occur in the future and it is important that regulatory oversight is maintained over the use of this technology that is becoming more and more widespread with every passing day. The recent blockchain antitrust case filed in the USA showcases the need for there to be clarity on how these two domains interact.¹⁸⁸

It has been found that blockchain technology is capable of being used to serve anti-competitive ends – by way of collusion and abuse of dominance. However, many challenges are faced even at the point of applicability of competition law to the blockchain, given its unique nature. The first concern pertains to the legal nature of blockchain and whether it satisfies the definition of

¹⁸⁴ Cryptocurrency and Regulation of Official Digital Currency Bill, 2021.

¹⁸⁵ Finance Act 2022, s 28; Income Tax Act 1961, s 115BBH.

¹⁸⁶ 'India finalising consultation paper on crypto currencies: DEA secretary' Times of India (New Delhi, 30 May 2022) < <https://timesofindia.indiatimes.com/business/india-business/india-finalising-consultation-paper-on-cryptocurrencies-dea-secretary/articleshow/91899135.cms>>.

¹⁸⁷ Competition Commission of India, 'Discussion Paper on Blockchain Technology and Competition' (2021) 43 <https://www.cci.gov.in/sites/default/files/whats_newdocument/Blockchain.pdf> accessed 6 January 2022.

¹⁸⁸ *United American Corporation v. Bitmain Inc.*, (2018) Case No. 1-18-cv-25106 (S.D. Fla.).

“enterprise” as required under the Act.¹⁸⁹ The essential characteristics of blockchain, namely, decentralization, pseudonymity and immutability also pose their respective problems. Decentralization poses an issue when it comes to determining the actual subject of liability in a blockchain, as to whether liability would be on the blockchain developers, users or miners, or all of them collectively, and the methodologies to determine this liability. Moreover, private blockchains cause challenges in even detecting anti-competitive conducts over a blockchain and extracting the requisite information, thereby reducing the likelihood of *suo-moto* actions. Pseudonymity makes it difficult for authorities to ascertain the true identity of the users behind any anti-competitive conduct, and immutability makes it difficult to remedy any anti-competitive actions once detected, as the algorithm or code would continue to self-enforce.

Nonetheless, these characteristics are the definitive features of a blockchain and thus cannot and should not be eliminated from the technology. Thus, competition law must find a way to apply to the blockchain without compromising its essential qualities, whilst also ensuring that the blockchain does not become a playground for players to indulge in anti-competitive practices. As proposed by Dr. Schrepel, this can be ensured by adopting what is called the “*law is code*” approach, which involves close coordination between legal as well as technical authorities to ensure that the very code giving rise to a blockchain has some default measures in place against future misconduct.¹⁹⁰ Smart contracts can be embedded into the code that allows competition authorities to infiltrate into the technology and gain access to information when required. There can also be smart contracts authorizing competition authorities to take particular actions upon the happening of particular events.

Moreover, blockchains can be mandated to set up grievance systems in place to ensure that any user is able to report any dubious or anti-competitive conduct that it suspects. Whistle-blower mechanisms may also be implemented for private blockchains. In the case of private blockchains, mandatory notification requirements to the CCI may also be imposed which would allow it to detect and track the existence of any blockchain consortium existing in the market. To resolve the issue of cross-border jurisdiction and enforcement, close cooperation is needed between competition agencies across the world.

¹⁸⁹ Vishal Rajvansh & Saumya Sinha, ‘The Interaction Between Blockchain and Competition Law in the Indian Competition Regime’ (Kluwer Competition Law Blog) <<http://competitionlawblog.kluwercompetitionlaw.com/2021/05/05/the-interaction-between-blockchain-and-competition-law-in-the-indian-competition-regime/>> accessed 15 January 2022.

¹⁹⁰ Dr. Thibault Schrepel, ‘Is Blockchain the Death of Antitrust Law? The Blockchain Antitrust Paradox’, (2019) 3 Geo. L. Tech. Rev. 326.

Section 49 of the Act¹⁹¹ places a responsibility on the CCI to undertake competition advocacy activities which include spreading awareness and promoting competition in India. These efforts can be extended to include blockchain users, developers and business owners. Competition policy can be coded into the technology to prevent sharing and storing of sensitive information so that the technology is compliant with competition law. Therefore, steady implementation of the “*law is code*” approach would greatly ensure that regulatory oversight by competition agencies is maintained over the use of blockchain technology, without compromising its basic features. Technology and law cannot exist in isolation. They must complement each other and operate in consonance.

¹⁹¹ Competition Act 2002, s 49.