



Blockchain and competition law

Once, blockchain was considered a niche technology, and it was too early to consider competition-law implications. Today, we know the technology should be taken as seriously as the development of the internet in the 1990s. This thought piece provides an overview of what blockchain is and what the stakeholders in a blockchain do. Once this is established, we will then briefly identify whether any actions taken by blockchain stakeholders could constitute a breach of competition law.

Let's start with why blockchain exists. A transaction between parties can only function – particularly if the parties repeatedly transact – if there is trust and proof of the transaction. Since a digital asset can be replicated many times, a transaction of a digital asset must ensure that replication cannot occur when it is not intended. Blockchain is a technological solution delivering a concept called a “distributed ledger,” which essentially is a way of making sure changes to any piece of information on the ledger can happen only by consensus from the blockchain stakeholders. Blockchain can replace and arguably improve on existing methods of creating trust and proof, such as when working with lawyers, notaries, corporate seals, counterpart agreements, official (government-organized) records, deeds of sale and certificates of authenticity.

Four technologies are behind blockchain. First, encryption is a technology that has been around for a long time and is designed to address trust. For public-key encryption, for example, which pairs public and private keys, a person may send an encrypted message to a recipient using the recipient's public key (open-source software that scrambles the information). Then, using her own unique, private key, the recipient can unscramble the message. The second technology is called a hash, which takes digital input and converts it to an encrypted digital output. The function of a hash is to ensure that the digital output, in its journey from sender to recipient, has not been tampered with. The third technology is the chain. The chain comprises blocks of information that have been cryptographically validated. There is a

hash link between each block. Any modification to a transaction anywhere in the chain will affect that block's hash and thus break the chain. The fourth is consensus synchronization, namely the system that makes sure the stakeholders do not recognize (authorize) transactions if there is a break in the chain. In a private blockchain community of stakeholders, that is relatively easy to arrange. In a public blockchain community, the synchronization consensus must be built into the architecture.

So, how might competition law apply to blockchain and its stakeholders? First, let us address dominance. At this point in time and for the foreseeable future, it seems unlikely that a particular blockchain would be determined to hold a dominant position. However, a likely situation for an alleged misuse of a dominant position would be a refusal to deal (not allowing an entity to join a blockchain community). For example, imagine a blockchain existed among European banks for interbank payments. There may exist another way – the old way – of clearing interbank payments that is valid but slow and costly in comparison. If a new bank wanted to set up business in Europe, being a member of the blockchain may be necessary if it intends to become a competitive force. If the new bank is refused access or membership for nonobjective reasons or on a cost basis that is not objective and reasonable, this might constitute an abuse.

It's possible that a community of alternative blockchains may be able to operate in the same market. Similar to some internet markets, it may transpire that a single "dominant" player arises. There might be a temptation to lowball the price of participation as a stakeholder to encourage market-share growth, leading perhaps to an allegation of predatory pricing. Making a claim that an entity holds a dominant position and is conducting predatory pricing is difficult. There are a few successful cases. Flipping the coin, excessive pricing is an abuse of a dominant position. Precedent shows this is an even harder claim to win. Either way, it is not the blockchain itself that would make such a case difficult to win – so, in this context, stakeholders' concerns that their "unique" blockchain is engaging in abuse at this stage in the blockchain evolution are unduly held.

In relation to anticompetitive agreements, analysis of members' blockchain agreements has a parallel with other groups, such as cooperatives in the agricultural sector, trade-association agreements, standards-setting organizations and sports organizations. Some aspects, such as the insistence on using certain tools to the exclusion of others – the hash tool MD5, for example – are likely not anticompetitive. They

exist to ensure the blockchain can function as intended and only one tool can be used for a particular blockchain. As for a special agreement constructed for only two stakeholders in a blockchain community, that is not likely. It would be counter to the concept and architecture of a blockchain. This means that in a blockchain of 200 stakeholders, for example, 10 of them could not take secret actions related to the blockchain. If any stakeholder sought to operate the blockchain in a way that was not in accordance with the protocols and tools established by the blockchain, that stakeholder's actions would simply have no effect on the operation of the blockchain or its information.¹

The exchange of information is a common element of all cartels and a fundamental element of blockchain. Can stakeholders who compete in the same market use blockchain in a way that constitutes a cartel? Can they exchange information to enable them to make better-informed decisions in the market? To state the obvious, if a cartel wishes to use blockchain to support or facilitate it, it is, of course, possible in the same way a cartel can use email or the telephone.

What is relevant to consider is whether the nature of a blockchain could inadvertently create or facilitate a cartel. A leading reason for this possibility is the element of blockchain's transparency. In principle, every member of a blockchain can find out the details of a transaction conducted using the blockchain. This suggests that price coordination might emerge as competitors in a blockchain see prices change with greater speed and accuracy than before, and adapt their future actions as a result. The same can be said for any other material informational elements affecting competition that are also recorded in the blockchain transactions. To the extent this may be an issue, a solution is readily available. While it is correct that all members of the blockchain share the same ledger and therefore see the same information, some information could be stored off the blockchain. For example, and depending on the situation, the sale of a product and the transfer of ownership could be on the blockchain, while the price at which it was sold can be stored off the blockchain. These safeguards are particularly relevant to a public blockchain. For a private or hybrid blockchain, access permissions at the node level (that is, each connected computer) can be created to deny access to information for different classes within the blockchain. An additional potential concern is that stakeholders can add "noise" or information to the blockchain, even though this is not deemed useful to others and not necessary for the blockchain to function. This occurred in the early years of Bitcoin, with

¹ Distinct groups in a blockchain can occur through the action of stakeholders, resulting in a "fork" in the blockchain. However, these are known to all the blockchain stakeholders. As such, they are acknowledged and in some cases are validated by the community. This occurred in relation to Bitcoin on 12 March 2013.



stakeholders adding comments to verify transactions even though by definition this is unnecessary. Whether or not such information raises a competition concern will depend on the nature of the information, particularly if it relates to the competitive interface of the blockchain users.

As can be seen from this brief discussion of competition-law issues related to blockchain, there does not appear to be an argument for companies to be overly cautious about using blockchain due to a material risk of breaching competition law. Some thought, however, should be given to the information that is included in the blockchain, particularly if the blockchain community is comprised of competing entities. That information may need to be filtered or removed from the blockchain. Given the nature of blockchain, these structural elements should be included at the setup phase of the blockchain. Of course, as Adam Smith noted, “People of the same trade seldom meet together ... but the conversation ends in a conspiracy against the public” – one cannot exclude anticompetitive effects by those intent on creating them.

As the technology evolves and is implemented beyond the current cryptocurrency focus, further analysis may be required. At this stage, corporations should not be discouraged for competition-law reasons from serious consideration of the possibilities of blockchain technology.



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Overview of blockchain for energy and commodity trading

Product life cycle management using blockchain

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