



**Monetary and Banking Research Institute**  
Central Bank of the Islamic Republic of Iran

# **Investigating the jurisprudential and legal aspects of using smart contracts in the Iranian financial system**

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## **Investigating the jurisprudential and legal aspects of using smart contracts In the Iranian financial system**

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### **Report summary**

The digital revolution is one of the most important phenomena of the present age, which has caused digital technologies to quickly penetrate into all areas of human life and the rule of the game in various fields, including economics, business, education and learning, communication, work, leisure, art, etc. has changed. Concepts such as "artificial intelligence," "Blockchain," "cryptocurrencies," "Big Data," "Internet of Things," "financial technology or Fintech," "regulatory technology or Regtech," and "**Smart Contracts**" are some examples, which are presented in the digital revolution and have led to dramatic changes in various industries and financial services.

"**Smart contract**" is one of the technological developments in the current era that is transforming the industry and business processes. Smart contracts can be considered as a new generation of electronic contracts that have emerged after previous generations. The first generation of electronic contracts is known as contracts based on binary or "binary signatures". This type of contract, in which the terms of the contract are verified through a binary signature (the default phrase of a system such as "I agree"), is known as the simplest type of electronic contract and is usually concluded by clicking the buy button in virtual stores. The second generation of electronic contracts is known as "data-oriented contracts" and includes contracts in which individuals execute transactions by providing instructions to electronic systems. Electronic systems represent individuals in conducting electronic transactions in cyberspace and exchange according to what is set out in terms of the client's contract. Examples of such contracts can be found in the field of online stock trading. With the increasing advancement of information technology, today, a new form of electronic contracts called smart contracts has emerged.

According to the Capgemini, smart contracts will soon be the mainstream, and more and more products and services will be designed and marketed based on smart contracts. According to the latest figures released by the Market Research Future in May 2019, the volume of smart contracts with an average annual growth rate of 32% at the end of 2023 is expected to reach \$300 million.

But what are smart contracts, and in what industries are they used? One common example of understanding smart contracts is vending machines located in public places and used to sell



food, beverages, books, etc. The vending machine's mechanism is based on the if-then logic, in which, for example, when a person intends to buy a beverage, he enters money into the machine, and the machine automatically processes the money and delivers the beverage without having to be an intermediary. This device includes a set of irrevocable actions in which money is received, and the relevant goods are offered. Once the activity starts with payment, it is impossible to stop or return it because it is pre-programmed and placed in the vending machine as a code.

The smart contract's main purpose is to facilitate the transfer of digital assets between the parties to the contract in accordance with pre-determined terms and conditions. In this type of contract, the terms and conditions are defined in the form of software codes as "if ... then " to automatically execute the agreed obligations. These contracts are "self-enforcing" in nature and perform tasks and functions without manual intervention. A smart contract allows you to execute valid transactions with minimal reliance on third parties.

The theoretical basis of smart contracts goes back to game theory, which Nick Szabo proposed in the 1990s (Szabo, 1997). At the time, the smart contract included a computer trading protocol that enforced the contractual terms of the agreement. Initially, computer systems contracts that accounted for daily receipts and payments came into play for decades in the United States and some developed countries. The idea of Szabo did not receive much attention for a long time due to the lack of technology to support it, but later, the emergence of Blockchain technology and the invention of Bitcoin as the first cryptocurrency in 2009 paved the way for the expansion of smart contracts. Bitcoin was considered as a limited edition smart contract. Ethereum later provided better capabilities for building more sophisticated smart contracts using a special programming language called Solidity.

In general, a smart contract can be considered a set of computer codes or algorithms that, in the form of Blockchain technology, has made it possible to execute contract terms automatically and without third-party intervention. Smart contracts are used in a variety of fields, from the Internet of Things to the participatory economy. In general, these applications can be divided into six main areas: financial industry, data authentication, participatory economics, government and public sector, IoT, and distributed systems security.

Studies show that smart contracts with features such as self-executable, automated, tamper proof, minimum reliance on intermediaries, cost effective, and simplicity, can increase process speed, save costs, improve transparency, increase business process efficiency, and reduce potential risks.

It is clear that traditional contracts, unlike smart contracts, are created mostly by consulting lawyers and legal experts and often contain specialized legal terminology. As a result, the general public is less aware of the terms and conditions of the contract. Traditional contracts



also contain many written documents that are in danger of being lost, which jeopardizes the security and confidentiality of the contract. Besides, the implementation of such contracts is highly dependent on third parties, and in the event of a dispute, individuals have to go to court. All of this clearly shows us the comparative advantage of smart contracts over traditional contracts.

Today, the banking, insurance, real estate, health, and many other industries are moving toward greater use of smart contracts and their benefits. Although smart contracts have created a new wave of innovation in business processes, there are also some challenges in its development, including inflexibility compared to traditional contracts, scenario complexity, technical challenges, regulation, and contractual responsibility.

The nature of technologies such as Blockchain and smart contracts is such that it usually tries to eliminate intermediaries in them somehow. Therefore, in public Blockchain technology, third-party monitoring and regulation will not be very desirable. But in the case of private Blockchain - which is more suitable for commercial and business applications - the necessary rules and regulations can be considered to determine the scope of activities in cases such as concluding and executing smart contracts. These laws and regulations should provide more grounds for the development and reasonable use of such contracts.

Examining the position of smart contracts and Blockchain technology in the Iranian legal system shows that although so far in the field of regulation, laws, and regulations related to crypto-currency as one of the important Blockchain technology applications have been considered. In this regard, documents have been published or are being considered for publication by institutions such as the Central Bank, the Ministry of Communications and Information Technology, and the Supreme Council of Cyberspace. Still, in the case of smart contracts and Blockchain technology, independent rules and regulations have not been submitted so far. It is noteworthy that there are currently some rules related to smart contracts, the provisions of which can also be used in the field of smart contracts. In fact, in addition to Civil Law and Commercial Law as basic laws in the field of transactions and contracts, special laws such as the "Electronic Commerce Law" adopted in 2003 are among the laws that can be cited; But there is no doubt that these laws are by no means sufficient and satisfactory. Given that some examples of smart contracts are currently being implemented in various industries, including financial services, and in the future, we will face more developments in this area, it is necessary to regulate the necessary rules and regulations and update them in line with technological developments.

In the other part of this report, the jurisprudential-legal aspects of smart contracts were analyzed. One of the famous jurisprudential rules is the rule of validity (Isalat-ul-Sihha); According to this principle, any transaction that takes place between two or more people is



judged to be valid until its corruption is discovered. According to this rule, all smart contracts on which the will of the parties have been formed are destined to validity unless proven that its basic conditions have not been observed. According to Article 190 of the Civil Code, for the validity of any transaction, it is necessary to observe four conditions: 1) the intention of the parties and their consent; 2) the competence of the parties; 3) the specific subject that is being traded, and 4) the legitimacy of the transaction. In order to ensure the existence of the four basic conditions for the validity of the transaction in smart contracts, it was necessary to analyze and examine all four of the above conditions. This report showed that smart contracts have the capacity and possibility to fulfill these four conditions.

Finally, some jurisprudential-legal challenges related to smart contracts were raised. The results of the study using the descriptive-analytical method and expert opinion polls showed that issues such as the possibility of Shariah supervision, responsibility system and performance guarantee in case of breach of smart contract obligations, contractual modification in smart contracts, and accountability system for error guarantee in smart contracts are among the most important jurisprudential and legal challenges in the field of smart contracts.

The results of this study in explaining the jurisprudential aspects of smart contracts and the proposed solutions to alleviate the existing challenges can be useful for programmers and designers of smart contracts on the Blockchain platform on the one hand and can be helpful for legislators and regulators in the fields of E-commerce and information technology, on the other hand.

It is worth noting that smart contracts are still in the early stages of development. With the dramatic growth of information technology, more and more actors are trying to reap digitalization benefits. Technological advances are accelerating digitalization, and industry players know that smart contracts make business processes faster, more secure, and cheaper. Various industries, including the banking and financial industries, have a good capacity to execute smart contracts, although the challenges ahead must be carefully considered and overcome by providing innovative solutions. It seems that the context of the smart contract sees the possibility and capacity to define and set more standards and rules (especially from Shariah's perspective). And future research should examine its challenges and practical solutions in more detail. In other words, this field is still a place of research, and there is no doubt that despite all the challenges, in the coming years, we will hear more news about the acceptance of smart contracts in commercial and non-commercial fields.



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