

**IS INSISTING ON SPECIFIC PERFORMANCE UNDER SMART CONTRACTS
DESIRABLE? INFLEXIBILITIES OF SMART CONTRACTS AND POTENTIAL
SOLUTIONS**

Outline of the Presentation

1. Introduction
2. Smart Contracts: Definition and Goals
3. Automatic Execution as a Distinct Feature of Smart Contracts
4. Is Insisting on Specific Performance by Automatic Execution Desirable? (With the example of efficient breach)

Smart Contracts: Definition, Goals and Legal Aspects

The Definition of Smart Contracts: Is It Smart or Automation?

- ensured execution of contractual terms (Szabo, 1996)
- ‘a channel of online agreements’ (Cuccuru, 2017)
- broader construction of ‘if-then’ relationship (Finck, 2019)
- Is Algorithmic Contracts Different? (Scholz, 2019)

The Aims of Smart Contracts:

- ▶ **Removing Trusted Intermediaries:**
 - ▶ Removal of trusted intermediaries such as courts or financial institutions by putting a piece of code in place as an alternative
 - ▶ Intermediaries record the transaction and solve disputes if such arise from the contract.
 - ▶ In the case of blockchain-enabled smart contracts:
 - ▶ the blockchain technology provides disintermediation in digital asset sales. (Cutts, 2019)
 - ▶ Are blockchain miners, new intermediaries?

The Aims of Smart Contracts

- ▶ **Reducing transaction cost: Does it reduce transaction cost or move the cost upfront?**
 - ▶ Smart contracts might reduce transaction costs as there is no litigation or enforcement procedures in the case of a breach as the code ensures the performance of the contract ? (Giancaspro, 2017)
 - ▶ In contrast to this idea, while decreasing the enforcement and litigation costs, the design process of the smart contract would inflict a much higher cost on the parties. (Murray, 2019)

Automatic Execution as a Distinct Feature of Smart Contracts

Automatic Execution as a Distinct Feature of Smart Contracts:

- This automatic performance is the consequence of embedding the required performance into the code.
- when the code is executed in the blockchain, it is highly resistant to alteration. (except when nodes collectively decide to unwind previously recorded transactions)
- **Possibility of modification of the contract:**
 - the difference between 'contract states' and 'code' in Ethereum platforms (Ethereum Virtual Machine)
 - use of oracles: oracles can be used to adopt contracts to changing circumstances

The Inflexibility of Smart Contracts: Are They Unsolvable?

The incompleteness of contract: unpredictability of future events: ‘a contract is incomplete if and only if it does not incorporate some information about the state of nature that it would have been optimal for the contracting parties to include.
(Aderlini and Felli, 2000)

- **Changing of Circumstances after the conclusion of the contract:** the immutable nature of smart contracts exacerbates the problem of the incomplete contract as the terms and conditions of these contracts cannot be modified as a rule. This might cause a more rigid application of smart contracts which would deter people from using them.
- However, it can be solved within the design of smart contracts:

- ▶ **The Modification Mechanism within the Design of Smart Contract**
 - ▶ This inflexibility arising from the structure of smart contracts would be alleviated by a modification mechanism embedded in the code. Contractual parties can write renegotiation clauses into their smart contracts to solve this rigidity. (Marino and Juels, 2016)
 - ▶ Modification mechanism within the smart contract is solving hold-up problem (post-contractual opportunistic behavior)
 - ▶ Using oracles to adapt the contract to changing circumstances

Constructing automated performance as inflexibility

- This feature can be a mere manifestation of *pacta sunt servanda* and can be applauded as a proper solution and deterrent to post-opportunistic behaviours by the parties.
- On the other side of the coin, a strict application of the no-breach idea might be considered stringent. Allowing a breach by the parties in contract law allows business life to be more flexible to accommodate contingencies (changing circumstances).
 - An informal dialogue to solve disputes
 - non-enforcement of the contract would have the same benefits as enforcement in the courts.

Therefore,

- Self-execution would be inflexible

Is Insisting on Specific Performance by Automatic Execution Desirable?

The design of smart contracts presumes the desirability of specific performance under the contract.

Thus, the essential question related to the practicality of smart contracts is whether their automatic execution is always desirable by the contractual parties.

- ▶ The Change of Circumstances surrounding contracts:
 - ▶ An opportunistic move by one of the contractual parties, relying on sunk investment made by other party
 - ▶ Force majeure
 - ▶ More valuable offer from a third party: Parties would prefer to breach the contract instead of performing it.
 - ▶ Contract law: Remedial Institution (Werbach and Cornell, 2017)
 - ▶ Primary Remedy in Common Law as a rule: Damages rather than specific performance (A right to change his/her mind after the conclusion of a contract) (Mik, 2017)

Efficient Breach Theory as an Illustration of the Inflexibility Smart Contracts

Law and Economics Perspective: If a contract does not produce a total efficiency for the parties, contract law should not enforce a requirement for these parties to perform their contractual obligations.

Efficient breach theory is developed by law and economics scholars to theorise how parties might breach a contract voluntarily for the sake of efficiency.

This theory states that contractual parties are allowed to breach a contract and pay expectation damages if the breaching party concludes that breaching the contract would be more efficient than paying the expectation damages. (Posner, 1973)

Possibility of Efficient Breach under the Idea of Smart Contracts

- ▶ There are many disapprovals against efficient breach theory
- ▶ However, the possibility of an efficient breach reflects a potential response by contractual parties if a fortunate contingency comes to light after the agreement is finalised.
- ▶ The idea of the smart contract would ignore people's tendencies to pursue more profitable transactions even after the conclusion of the previous contract.

The Possible Solution within Smart Contracts

- ▶ **Securing Liquidated Damages as well as specific performance:**
 - ▶ Allowing breach making smart contract useless?
 - ▶ Automatic Execution as a distinct feature of the smart contracts can be manifested in other ways: liquidated damages
 - ▶ This type of structure gives the parties two choices, either paying liquidated damages or specific performance. This basic structure can be achieved by giving limited discretion to the contractual parties the choice of either. (Holden and Maldani, 2017)

Conclusion

1. Smart Contracts: Definition and Goals
2. Distinct Feature of Smart Contracts: Guaranteed Performance of Contract
3. Inflexibilities: Incompleteness of Contract and Not Allowing for Breach
4. Efficient Breach Theory as Illustration of Inflexible Side of Smart Contract and Potential Solution with the Design