

Blockchain-Cryptocurrency and their Effects on the Financial Industry

Institute of Financial Services Zug IFZ

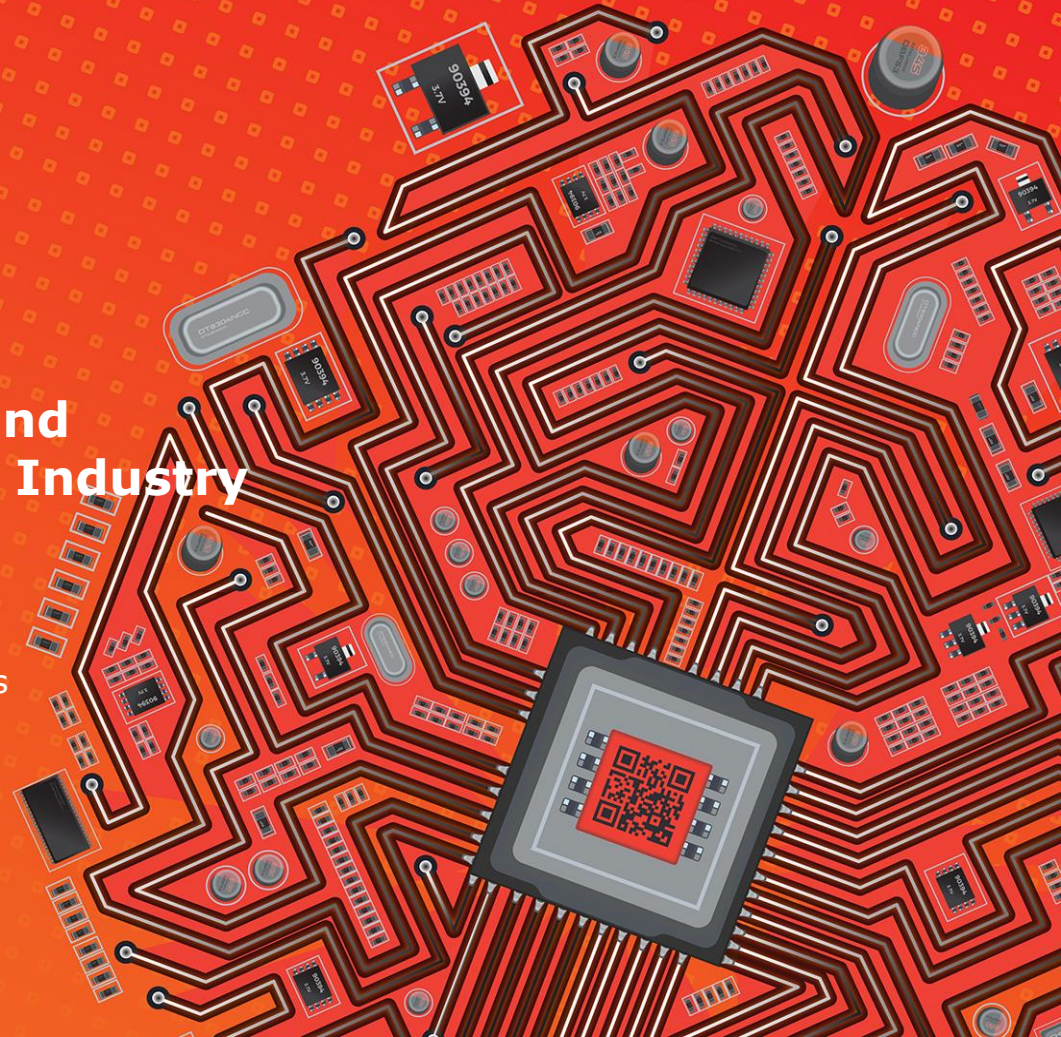
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Content

- **Definitions and Framework**
- Impact on the Financial Industry
- Current Developments and Prospects for Switzerland

(Crypto) Asset Taxonomy

- The ongoing technological innovation in the underlying distributed ledger technology has led to an increasing transformation of traditional financial markets into crypto-based markets. Although there are asset classification frameworks for both traditional finance and the crypto economy, a holistic approach merging both worlds is still lacking. There is no standardized terminology regarding asset characteristics, especially when comparing traditional finance with the crypto economy.
- Derivation of a classification framework to ensure that the various stakeholders, such as investors or supervisors, have a consistent view of the different types of assets, and in particular of their characteristics.
- Unlike existing asset classification frameworks, the taxonomy bridges the gap between traditional finance and the crypto economy using a morphological box, thus creating a clear terminology.
- The morphological box is based on 14 different attributes by which each type of asset can be properly classified. These attributes include the claim structure, technology, underlying, consensus-/validation mechanism, legal status, governance, information complexity, legal structure, information interface, total supply, issuance, redemption, transferability, and fungibility.
- Due to the methodological approach, the individual attributes can be expanded or broken down at any level of detail without changing the overall framework.
- The classification of selected assets, such as bitcoin and cash, has shown that the proposed taxonomy is applicable in practice.

(Crypto) Asset Taxonomy

Claim structure	No claim(s)		Flexible claim(s)		Fixed claim(s)	
Technology	Physical		Digital		Distributed ledger technology	
					Native token	Protocol token
Underlying	No underlying	Company	Bankable asset	Cryptographic asset	Tangible asset	Contract
Consensus-/Validation mechanism	Instant finality			Probabilistic finality		
Legal status	Regulated			Unregulated		
Governance	Centralised			Decentralised		
Information complexity	Value		Contract		Turing completeness	
Legal structure	No legal structure	Foundation	Note/bond	Share	Other	
Information Interface	No interface		Qualitative		Quantitative	
Total supply	Fixed		Conditional		Flexible	
Issuance	Once		Conditional		Flexible	
Redemption	No redemption	Fixed	Conditional		Flexible	
Transferability	Transferable			Non-transferable		
Fungibility	Fungible			Non-fungible		

(Crypto) Asset Taxonomy – Explanatory Notes (I)

Claim structure: Does the asset represent a claim, i.e., a demand for something due or believed to be due?

- No claim(s): The asset does not represent any kind of claim.
- Flexible claim(s): The asset represents certain claims, the possession or exercise of which can depend on certain conditions (e.g., catastrophe bonds).
- Fix claim(s): The asset represents claims which can neither be restricted nor restrained under any condition (e.g., fixed income).

Technology: Which technology underlies the asset?

- Physical: The asset exists in a physical form (e.g., gold bullion).
- Digital: The asset exists in a digital form, but is not based on the distributed ledger technology (e.g., electronic share).
- Distributed ledger technology: The asset is based on the distributed ledger technology, structured either as a native token, i.e., a token that is native to a specific blockchain, or as a protocol token, i.e., a token issued on an existing blockchain protocol such as, for example, ERC-20 or ERC-721 tokens for the Ethereum blockchain.

Underlying: On which underlying or collateral is the asset's value based on?

- No underlying: The asset's value is not a derivative of an underlying asset (e.g., bitcoin).
- Company: The asset's value represents a stake in a company (e.g., equity).
- Bankable asset: The asset's value represents a bankable asset, i.e., an asset that can be deposited in a bank or custody account (e.g., fiat currencies).
- Cryptographic asset: The asset's value represents a cryptographic asset, i.e., an asset based on the distributed ledger technology (e.g., derivative of cryptographic asset).
- Tangible asset: The asset is in a physical form (e.g., real estate).
- Contract: The asset's value represents a contract (e.g., license agreement).

(Crypto) Asset Taxonomy – Explanatory Notes (II)

Consensus-/ Validation mechanism: How is the agreement on the finality (e.g. property rights or ownership transfer) of the asset been reached?

- Instant finality: Consensus is final. Mechanisms that typically, but not necessarily, belong to the deterministic type, are for example, notary services or qualified written form.
- Probabilistic finality: Consensus is not final, but reached with a certain level of confidence. Mechanisms that typically, but not necessarily, belong to the probabilistic type are, for example, proof-of-work or proof-of-stake.

Legal status: What is the regulatory framework governing the asset?

- Regulated: There are regulatory requirements for the issuance, redemption and governance of the asset.
- Unregulated: There is no specific regulatory framework for the issuance, redemption and governance of the asset.

Governance: In which way is the asset governed?

- Centralised: The asset is governed by an authoritative party or consortium.
- Decentralised: The asset is governed without centralized control (e.g., certain types of cryptographic assets such as bitcoin).

Information complexity: What type of information complexity is associated with the asset?

- Value: The asset represents a specific value (e.g., currencies).
- Contract: The asset encompasses conditional information in addition to its value (e.g., coupon bonds or DLT-based smart contract).
- Turing completeness: The asset is based on a Turing-complete («universally programmable») computational model (e.g., Ether).

(Crypto) Asset Taxonomy – Explanatory Notes (III)

Legal structure: What is the legal form of the asset?

- No legal structure: There is no legal structure governing the asset.
- Foundation: The asset is governed by a foundation/trust structure.
- Note/Bond: The asset is structured as a note or bond.
- Share: The asset is structured as a share.
- Other: The asset has an alternative legal structure (e.g., central bank money).

Information interface: How does the asset receive and/or send relevant information?

- No interface: The asset has no kind of information interface.
- Qualitative: The asset manages relevant information indirectly through an authorised instance (e.g., general assembly).
- Quantitative: The asset manages relevant information from authorised sources automatically (e.g., IoT sources or oracle interfaces in the case of DLT-based smart contracts).

Total supply: To which limit can the asset be generated?

- Fix: The total supply of the asset is fixed.
- Conditional: The total supply of the asset is dependent on predefined conditions.
- Flexible: The total supply of the asset is managed flexibly by authorised parties.

Issuance: How is the asset generated?

- Once: After an initial issuance, no additional units of the asset are issued.
- Conditional: Additional units of the asset are issued once predefined conditions are met (e.g., newly issued cryptographic assets through mining).
- Flexible: Additional units of the asset can be issued flexibly by authorised parties (e.g., increase in share capital).

(Crypto) Asset Taxonomy – Explanatory Notes (IV)

Redemption: How is the number of outstanding assets reduced?

- No redemption: The number of outstanding assets cannot be reduced.
- Fixed: The reduction of the number of outstanding assets follows a predefined protocol.
- Conditional: The reduction of the number of outstanding assets is initiated once predefined conditions are met.
- Flexible: The reduction of the number of outstanding assets can be carried out flexibly by authorised parties (e.g., share buyback).

Transferability: Can the asset's ownership be transferred to another party?

- Transferable: The asset's ownership can be transferred to another party.
- Non-transferable: The asset's ownership cannot be transferred to another party, for example, by sale or giveaway (e.g., some types of registered securities).

Fungibility: Can the asset be interchanged with another asset of the same type?

- Fungible: The asset is substitutable with another asset of the same type.
- Non-fungible: The asset is not substitutable with another asset of the same type (e.g., artwork).

Classification of Bitcoin and Cash

Claim structure	No claim(s) 	Flexible claim(s)	Fixed claim(s) 
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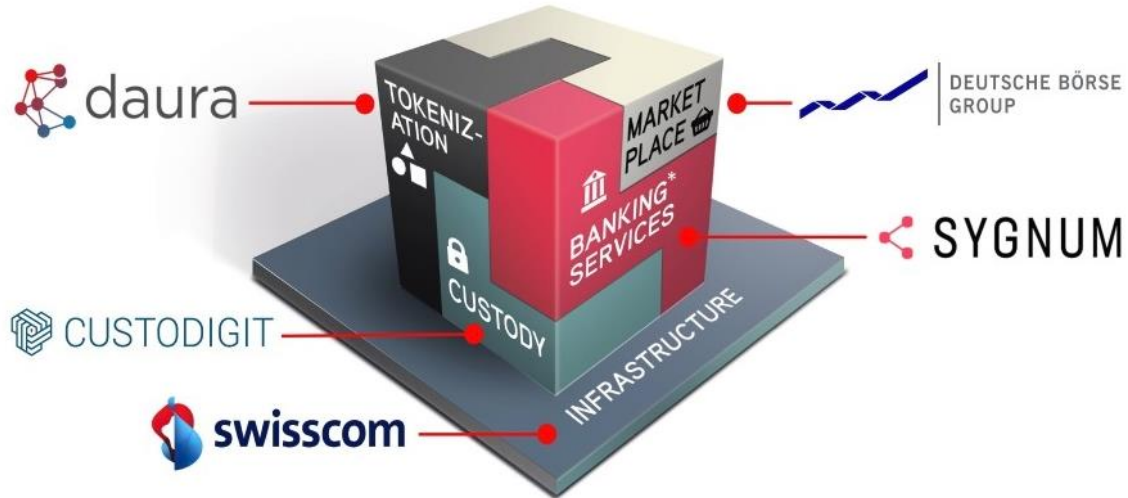
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- Current Developments and Prospects in Switzerland

Crypto Asset Management

- Crypto assets (cryptocurrencies)...
 - Are uncorrelated to other asset classes
 - Are highly volatile
 - Have a low market capitalisation and liquidity
 - Have a high Bitcoin dominance
- First funds (active and passive) and derivative structures are available.
- The markets are still mostly unregulated and intransparent with different types of risk, not only market risks.
- The convergence of private and public markets is fluid. The trend of Initial Exchange Offerings (IEOs) reflects this, where Binance was particularly active.
- The Distributed Ledger Technology (DLT) offers unique technical possibilities. But it is searching for use cases. Perhaps data markets are the next big thing.

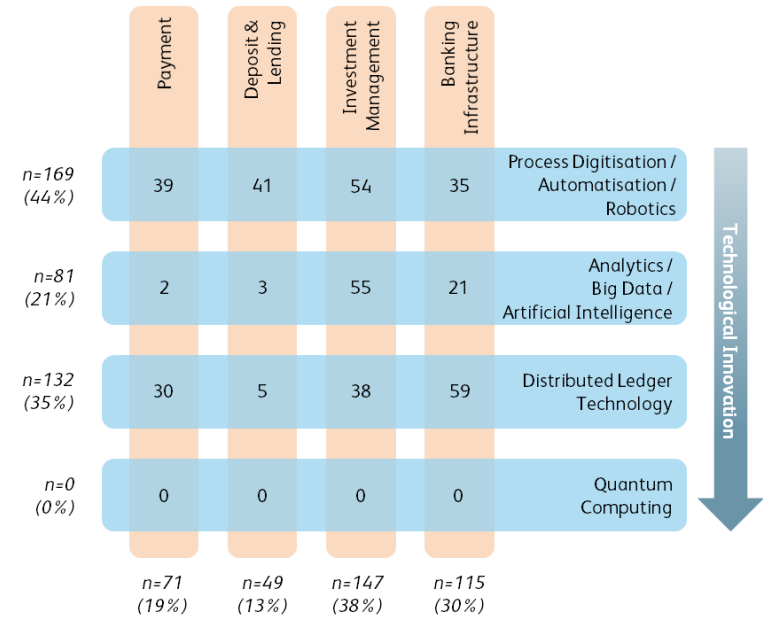
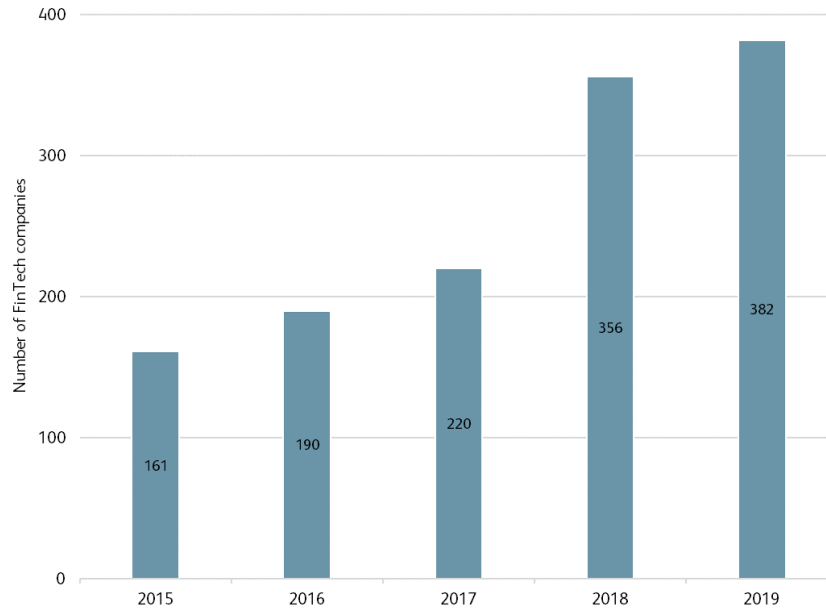
Digital/Tokenised Asset Ecosystem



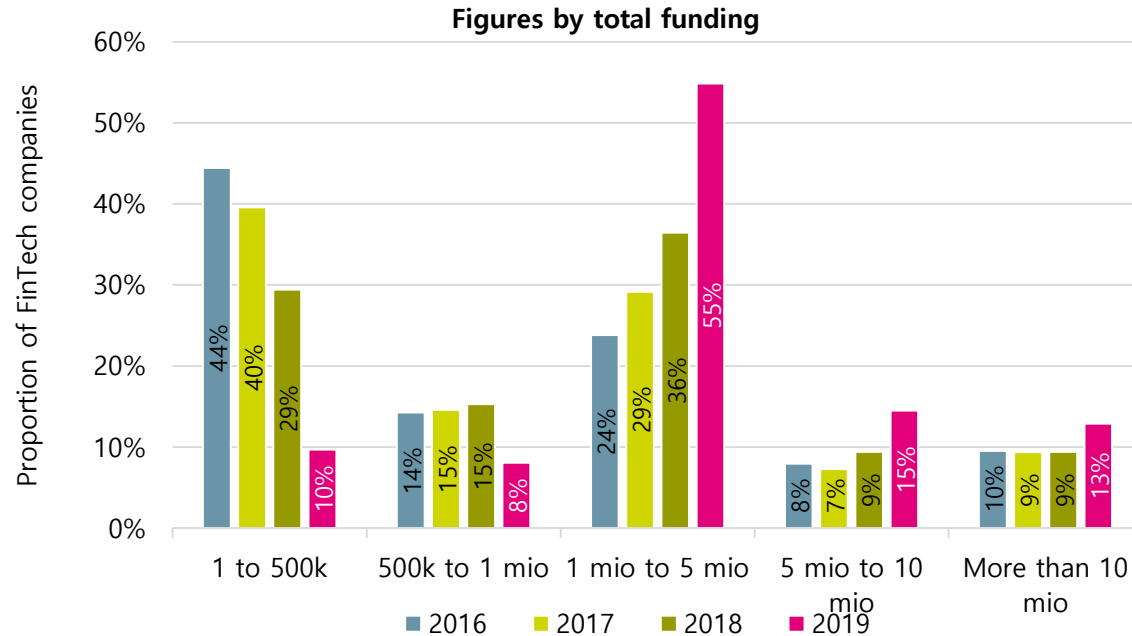
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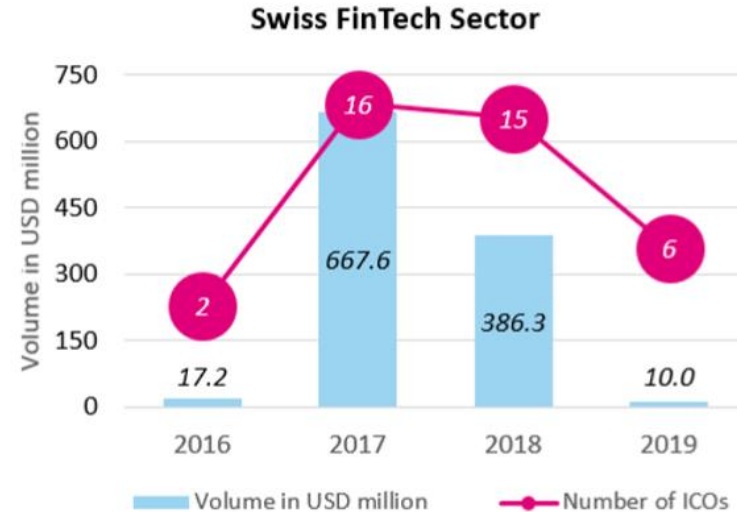
Overview of FinTech companies in Switzerland



Proportion of FinTech companies by total funding ($n_{2019}=62$)



ICOs in the global (left-hand graph) and Swiss (right-hand graph) FinTech sectors

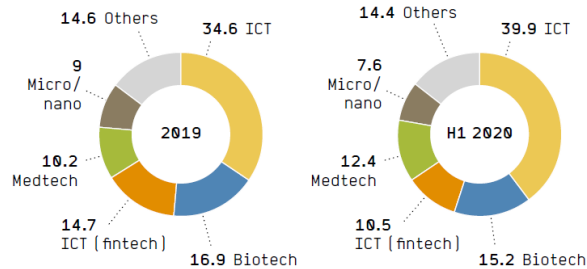


Investments in Swiss start-ups in the first half of the year

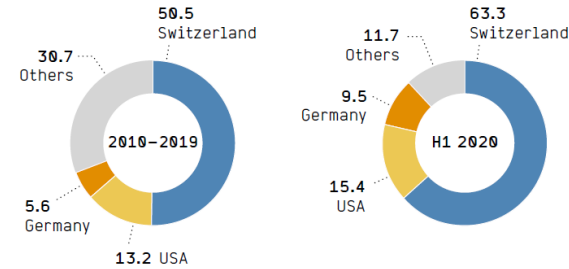
First half year	Invested capital (in CHF m)	Number of financing rounds
2016	566.4	63
2017	275.3	64
2018	456.1	82
2019	1183.0	85
2020	763.4  -35%	105  +24%

Details of the investments

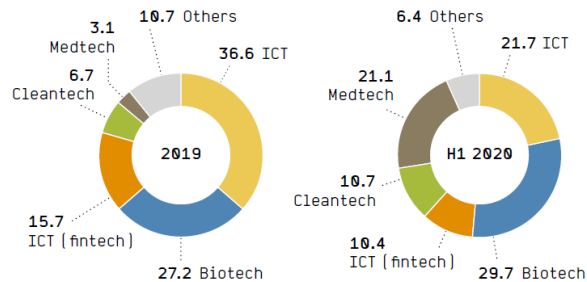
Share of financing rounds by sector in %



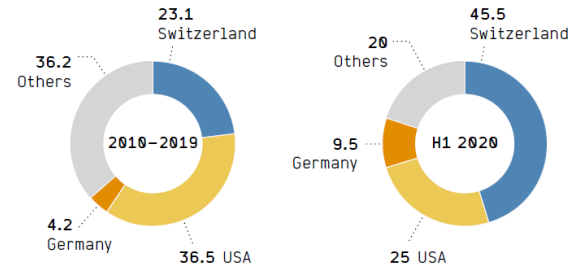
Share of number of investments by country of investor in %



Share of invested capital by sector in %



Share of invested amount by country of investor in %



Source: Crunchbase / University of Lausanne / Startupticker.ch

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