Reasons for Public Blockchain Stagnation

M.Sc. Eng. Arkadiusz Iwanicki

Department of Economic and Medical Informatics

FACULTY
OF ECONOMICS AND SOCIOLOGY
University of Lodz

Research problem

72% of crypto projects between 2020 and 2021 were abandoned by developers.

The life cycle of a cryptocurrency project **is 3 years** on average, which is much shorter than a typical market cycle.

The vast majority of cryptocurrencies **- 93%**, suffered from **low liquidity** or **trading volume**, indicating a sharp decline in investor interest.

AlphaQuest, *Dead Coins Report 2024*, access online: https://alphaquest.io/blog/dead-coins-report-2024/, dostęp 07.12.2024.

Identification of research gap

Existing crypto evaluation models mainly focus on **predicting token price drops**. However, the literature lacks comprehensive research on public blockchain networks, which are analyzed **as a technology rather than** merely **as financial instruments**.

The available research on cryptocurrency bankruptcy treats tokens on par with standalone blockchain networks. **Excluding tokens from the analysis** will allow for relevant results not only to speculators but also to people interested in the **practical applications of blockchain technology**. Such an approach can provide valuable information for developers, entrepreneurs, and institutions planning to build or integrate their solutions based on a given network, instead of treating it only as an investment instrument.

Sources:
Gandal, Neil, et al. "The rise and fall of cryptocurrency coins and tokens." *Decisions in Economics and Finance* 44.2 (2021)
Grobys, Klaus, and Niranjan Sapkota. "Predicting cryptocurrency defaults." Applied Economics 52.46 (2020): 5060-5076.
Ma, Donglian, T. U. Jun, and Zhaobo Zhu. "In search of cryptocurrency failure." (2023)
Peng, Sanshao, et al. "A systematic literature review on the determinants of cryptocurrency pricing." China Accounting and Finance Review 26.1 (2024)

Research objectives

Main objective of the study:

Identify technological, economic, and organizational factors that increase the probability of discontinuation of the development of public blockchain networks.

Specific objectives:

1. Develop an operational definition of 'discontinuation' of a public blockchain network and identify measurable criteria for project abandonment.
2. Determining the impact of selected design features on the probability of their stagnation.
3. Construction of a model/tool for predicting the discontinuation of project development.

Research methodology

Step 1: Data collection

Data sources:

- Coinmarketcap
- Web.archive
- CoinPaprika
- Github
- Bitbucket
- Whitepapers
- ICO drops
- Docs

Step 2: Quantification of qualitative data

- transform qualitative variables into numerical form

Step 3: Selection of variables and test method

- Selection of variables for the study and definition of the dependent variable (Y)

Step 4: Estimating the logit model

- Determining the significance of variables

Step 5: Training and validation of forecasting models:

- Logistic regression.
- Random forests.
- K-Nearest Neighbors (KNN)
- ?

Description of the dependent variable

NotInDevelopment	• **The lack of updates to the project's code over the past three years indicates that development has ceased.**
NotLiquidMarket	• Unable to sell the token due to very low liquidity (no transactions for the last two weeks) or removal from the exchange according to coinmarketcap.
WebsiteDown	• The project homepage is not available.

Explanatory variables

Technological

ConsensusMechanism
PoW (+)
PoS (-)
PoW/PoS (+)
Other (-)

Interoperability
Yes (-)
No (+)

SmartContracts
Non (+)
Partial (-)
Complete (-)

Economical

PeakMarketCap
(-)

LimitedTrade
Yes (+)
No (-)

SupplyLimit
(-)

Organizational

PublicSourceCode
Yes (-)
No (+)

InitialTokenDistribution
Mine (-)
Fork (-)
ICO (+/-)
Airdrop (+/-)

BlockchainType
Native (-)
Fork (-)
BasedOnBTC (+)
Template (+)

H1 – Technological factors

H1a. The consensus mechanism used in the project differentiates the risk of stagnation:

- Proof of Stake (PoS) and Delegated PoS (DPoS) projects have lower risk (–), thanks to greater efficiency and scalability;
- Projects based on the Proof of Work (PoW) consensus mechanism and PoW/PoS hybrids have a higher risk of discontinuation (+), which may be due to the frequent use of these mechanisms in projects that duplicate existing solutions without significant innovations.
- Projects with the "Other" mechanism have a varying impact (+/–), depending on the technical specificities.

H1b. The presence of extensive smart contracts (SmartContracts = Complete) reduces the likelihood of stagnation (–) as it increases the functionality of the network.

H1c. Project interoperability is associated with a lower risk of discontinuation (–) as it increases adaptability and interoperability with other ecosystems.

H2 – Economical factors

H2a. Projects with a fixed token supply limit (SupplyLimit) show a lower probability of discontinuation (–), as the deflationary nature of such assets may attract long-term investors and promote greater commitment to project development.

H2b. Projects that have achieved a higher market capitalization (**PeakMarketCap**) show a lower probability of stagnation (–), thanks to a greater financial background for further development.

H2c. The limited ability to trade the token (**LimitedTrade**) increases the risk of stagnation (+), indicating potentially unfair market practices.

H3 – Organizational factors

H3a. Blockchain projects that provide public source code (**PublicSourceCode**) have a lower probability of discontinuation (–), due to greater transparency and community trust.

H3b. The type of initial token distribution (InitialTokenDistribution) differentiates the risk of stagnation:

- **ICO**-funded projects have a higher risk of discontinuation (+), due to low barriers to entry and the risk of exit scams;
- **Forks** and **Airdrops** have an impact depending on the intentions and credibility of the creators (+/–).
- **Mining-based** projects typically have a lower risk of stagnation, as the mining process requires technical infrastructure and the involvement of network participants, which promotes the long-term sustainability of the project. However, some projects may have used implicit premine, which may partially offset this (+/-) effect.

H3c. The way the blockchain network was created (**BlockchainType**) significantly affects the risk of stagnation:

- **Native blockchain** projects have a lower risk of discontinuation (–) because they are built from the ground up with long-term development in mind;
- Projects based on **BasedOnBTC** and **Template** show higher risk (+), as less innovative;
- **Forks** can have a different impact (+/–), depending on the motivation behind their creation.

Explanatory variable selection results

Technological

ConsensusMechanism
PoW (+)
PoS (-)
PoW/PoS (+)
Other (-)

Interoperability
Yes (-)
No (+)

SmartContracts
Non (+)
Partial (-)
Complete (-)

Economical

PeakMarketCap
(-)

Li…tedT…e
No (-)

SupplyLimit
(-)

Organizational

Publ… Sourc… Code
…o (+)

InitialTokenDistribution
Mine (-)
Fork (-)
ICO (+/-)
~~Airdrop (+/-)~~

BlockchainType
…ative /
Template (+)

Results of logit model estimation

Variable name	Coefficient/ Parameter	p-value	Significance	Average Marginal effect
Consensus: Other	-2.355	0.016	**	-0.27
Consensus: PoS	-1.76	0.059	*	-0.19
Consensus: PoW	-2.07	0.131		-0.23
Distribution: Fork	-0.883	0.357		-0.11
Distribution: ICO	0.944	0.247		0.10
SmartContracts: simple	-1.883	0.126		-0.31
SmartContracts: complete	-2.604	0.037	**	-0.41
SupplyLimit	2.392	0.002	***	0.29
Interoperability	-0.755	0.357		-0.09
ln_peakmarketcap	-0.218	0.064	*	-0.03
const	4.39	0.057	*	–

Legend of significance levels: *** $p < 0.01$ ** $p < 0.05$ * $p < 0.10$

Model statistics	Value
Number of Observations	120
Pseudo R-square	0.445
AIC	114.2
BIC	144.9

	True +	True -	Total
Predicted +	56	13	69
Predicted -	7	44	51
Total	63	57	120

Correctly classified (accuracy): 83.33%

Summary of insights and further research

Summary of preliminary results:

- Technological factors such as the consensus algorithm (Other, PoS) and the presence of advanced smart contracts (SmartContracts = 2) significantly reduce the likelihood of project discontinuation.
- Projects with a fixed token supply limit (SupplyLimit) show a higher probability of discontinuation (+), which may be due to speculative mechanisms and a temporary increase in interest (FOMO).
- Organizational factor had limited impact on the abandonment of project development

Further research:

Future research will focus on increasing the sample, creating a forecasting model for the continued development of blockchain projects and adding new explanatory variables:

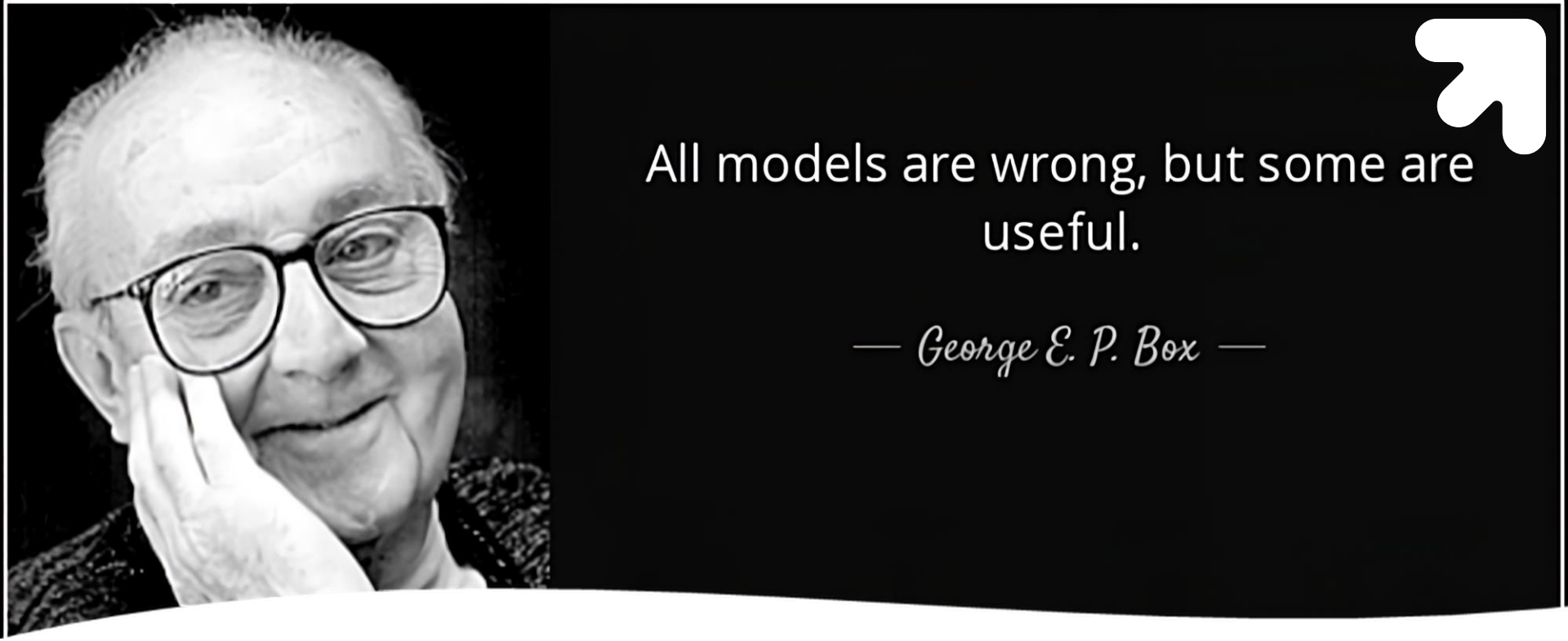
GithubContributors

BlockchainPurpose

MainCodeLanguage

Suggestions for additional explanatory variables

GithubContributors	**Number of people who explicitly participate in the code update of the public blockchain on github/bitbucket.**
BlockchainPurpose	**Purpose of the register designated by its creators:** • Currency • AnonCurrency • Shares • SmartContractPlatform • SocialMedia • Other
MainCodeLanguage	**Categorical variable specifying in which programming language most of the blockchain register code is written (information from github):** • C++ • Golang • JavaScript • C • Other



Thank you for your attention!

Contact email:
arkadiusz.iwanicki@uni.lodz.pl