The Behavioural Roots of Cryptocurrency Market Participation

Behavioural Economics

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Athens, 2021

Research Question

- In many countries with strong social and economic inequalities, people tend to invest in more risky assets such as cryptocurrency market to stand out. Why?

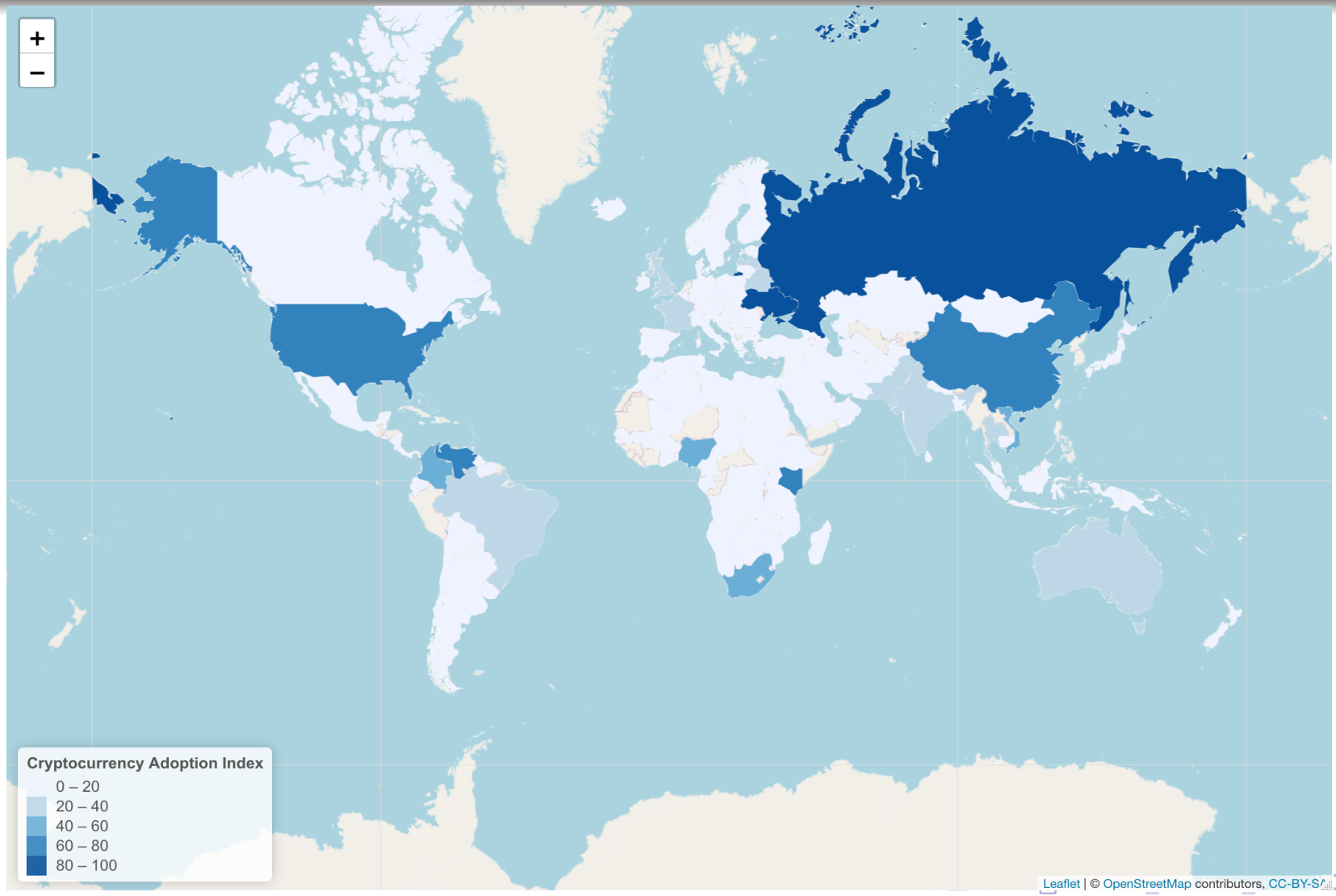
Contribution & Results 1/2

- Taking into account the previous question, we tried to build the appropriate econometric model that proves this hypothesis. Using data of socioeconomic, behavioral and folklore variables, we came to key conclusions about the roots of countries in the adoption of cryptocurrencies.
- Our research shows that countries with low living standards invest more in risky projects such as cryptocurrencies which presuppose a strong sense of patience and risk-taking. It also turns out that these countries are usually close to the equator and have a strong population diversity.

Contribution & Results 2/2

- Furthermore, researching the impact of tradition on the adoption of cryptocurrencies and studying the fairytales from the past, it was estimated that in nations where competition in stories was particularly frequent, it contributed to their competitiveness today and its high crypto market participation.

World Map of Cryptocurrency's Adoption



Motivation

- The world map shows the participation in the cryptocurrency market by country.
- It was observed that the participation is more intense in non-economically developed countries e.g. Ukraine, Venezuela, Nigeria, India etc.
- In contrast, in countries with a high standard of living, participation in cryptocurrencies was particularly low, e.g. European countries.
- Observing the above data, we became interested in investigating the reasons that cause this trend.

Introduction 1/2

- What Is Cryptocurrency in Simple Words?
- The story of Crypto began in 2008 when the Bitcoin domain was officially registered.
- Crypto are a new method of paying for goods and services that is done digitally. They work using a technology called blockchain.
- Blockchain is a decentralized technology that distributes copies of transactions across multiple computers with high security level.

Introduction 2/2

- Crypto have become very popular in the last year. More and more people are investing in them because:
  - They want to buy as soon as the prices are low for long-term profit.
  - Also, some people like this technology which goes beyond the traditional payment system of central banks.
  - It is safe and offers a quick profit with daily trading.

Literature Review 1/4

- Folklore (Stelios Michalopoulos, Melanie Meng Xue 2019)
  - Folklore studies how the collection of our traditional beliefs, customs and fairytales affect us today and explores how this cultural heritage can predict modern reality and our attitude.
- Diversity and Conflict (Galor et al., 2020)
  - This paper states that population diversity has contributed to the incoherence of society in historical and contemporary civil conflicts and to strong ethnic, linguistic and religious differences.
- On the origins of financial development: Ancestral population diversity and finacial risk-taking (Delis et al., 2020)
  - The above paper proves that ancestral diversity positively affects the participation in the stock market.

Literature Review 2/4

- Acceptance and Penetration of Bitcoin: The Role of Psychological Distance and National Culture (Abraham et al., 2019)
  - This article examines the factors that affect the penetration and acceptance of Bitcoin both individually and nationwide. Research concludes that individualism, avoiding uncertainty, long-term orientation can predict penetration while distance both physical and social can predict the acceptance of digital currencies.
- Cryptocurrency Market: Behavioral Finance Perspective (Bashar Yaser Almansour, 2020)
  - The article focuses on Arab investors who investing in the cryptocurrency market and explore the influence of behavioral factors on their investment decisions. It concludes that investors are significantly influenced by other investors, they operate profitably and this pushes prices to fluctuate sharply.

Literature Review 3/4

- Latitude Adjustment: Distance from the Equator Shapes Our Thinking (Paul A. M. van Lange, 2019)
  - How can we explain that happiness, creativity and individualism are higher, and that aggressiveness is lower, in countries farther way from the equator? It concludes that there are two ecological explanations.
  - The first is wealth. Nations farther away from the equator are also wealthier on average, providing opportunities for education, autonomy and personal growth—features related to happiness, creativity and individualism. That's why aggressiveness is weaker in wealthier countries too.
  - The second is natural threats, whether from pathogens venomous animals or natural hazards, which undermine happiness and make those in a group to protect themselves. Latitudinal psychology describes how cultural features are distributed over the world, with a focus on the north-south axis.

Literature Review 4/4

- Why Patience Is the Most Important Factor in Successful Investing (Billy Duberstein, 2020)
  - According to Duberstein B., today's financial media encourages investors to take excess action, which is actually one of the worst things one can do in investing. That's because the most important principle in investing is not how savvy your trading chops are, but something quite the opposite: patience.

Our Approach

- Our main goal is to explain the behavioral structure of crypto-users based on:
  - Socioeconomic factors and Genetic Diversity (Macroeconomic variables and Indexes),
  - Behavioral factors (Based on Hofstede's Cultural Dimensions),
  - Folklore (Stories of a community passed through the generations by word of mouth).

Research Methodology

- Our main variable we are trying to explain is Crypto Adoption per country.
- Starting with our first linear regressions, we try to build our basic model by researching which macroeconomic variables and indicators explain the participation of countries in cryptocurrencies.
- Taking our best regression model, we continue with new OLS by adding the behavioral variables step by step.
- At the last step we try to investigate if fairytales of our past can influence people to invest in crypto.

Baseline Model

$$CryptoAdoption = \alpha + \beta_1 * GDP + \beta_2 * Education + \beta_3 * Savings + \beta_4 * Gini + \beta_5 * EconomicFreedom + \beta_6 * SCI + \beta_7 * Latitude + \beta_8 * Diversity + \beta_9 * (Diversity^2) + \varepsilon_i$$

Variables used in the research

- We focus on:
  - Baseline Model: Cryptocurrency Adoption Index, GDP, Education, Savings, Diversity (ancestry adjusted), Social Cohesion, Latitude, Gini Index, Economic Freedom.
  - Behavioral Variables: Trust, Patience, Hope, Individualism, Altruism, Power Distance, Masculinity, Uncertainty Avoidance, Long-Term Orientation, Risk Taking.
  - Forklore Variables: Challenge_suc, Anti_success, Anti_notsuccess, Tricksters_punish, Challenge_competition.

Definition of variables 1/3

- **Cryptocurrency adoption rate** in the countries
- **Logarithmic GDP** of the countries as an average from 1960 to 2017
- **Education** which is an indicator that has been shaped by scores in mathematics, physics and reading in general
- **Savings**
- **Ancestry adjusted genetic diversity** of Ashraf and Galor which is a measure that reflects the distance that man traveled from Africa thousands of years ago
- **Index of social cohesion** that includes the social stability and prosperity of the country's population through health, equality, crime, freedom and satisfaction
- **Gini index**, which is the main measure of income inequality

Definition of variables 2/3

- **Economic freedom** calculated on the basis of taxes, unemployment, Inflation, debt, freedom of investment and other components
- **Absolute latitiude** is used to ark the north-south position of a location on the Earth's surface and ranges from 0 degrees at the equator to 90 degrees at the North and South Poles
- **Trust** as the confidence that one person shows in other people
- **Patience** that shows the ability to manage a situation without stress
- **Hope** that shows how optimistic people are about the future
- **Individualism**, individuals only take care of themselves and their families
- **Altruism** where you do a good deed and do not expect a reward

Definition of variables 3/3

- **Power distance** indicates the degree to which the least powerful members of a society accept this unequal distribution
- **Uncertainty avoidance**, where members of a society feel uncomfortable when it prevails
- **Long-term orientation** towards something shorter-term
- **Risk taking** related to how willing people are to take risks
- **Challenge successful**, where the hero wins and is associated with risk taking today
- **Antisucess**, where antisocial behavior is not punished and respectively **Antinotsucess**
- **Tricksters** punish where goblins are punished in fairy tales
- And **Challenge competition** where the competition is in fairy tales and shows the competition of countries today

Regressions

Socioeconomic Factors and Genetic Diversity

	Dependent variable:							
	Crypto Adoption							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	-7.593***	-8.276***	-8.351***	-6.735***	-2.455	-2.099	-1.875	-1.785
	(2.293)	(2.414)	(2.233)	(2.467)	(2.339)	(2.282)	(2.427)	(2.202)
Education	0.049***	0.051***	0.057***	0.060***	0.090***	0.096***	0.094***	0.082***
	(0.015)	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)	(0.014)
Savings		0.142	0.135	0.150	0.307**	0.255**	0.248*	0.194
		(0.154)	(0.143)	(0.141)	(0.126)	(0.126)	(0.129)	(0.118)
GiniIndex			64.522***	69.660***	52.323***	49.914**	48.301**	33.955*
			(21.772)	(21.790)	(19.036)	(18.552)	(19.520)	(18.293)
Economic Freedom				-0.442	-0.434	-0.408	-0.426	-0.389
				(0.303)	(0.258)	(0.252)	(0.261)	(0.237)
Social Cohesion					-1.538***	-1.268***	-1.273***	-1.414***
					(0.367)	(0.385)	(0.390)	(0.357)
Latitude						-0.255*	-0.228	-0.176
						(0.136)	(0.164)	(0.150)
Diversity(a.a.)							-28.749	15,019.820***
							(96.359)	(4,806.738)
Diversity sqrt(a.a.)								-10,602.280***
								(3,385.968)
Constant	15.665	14.908	-38.660	-31.420	-25.827	-38.877*	-15.982	-5,318.505***
	(18.615)	(18.664)	(24.994)	(25.179)	(21.511)	(22.048)	(79.912)	(1,694.977)
Observations	50	50	50	50	50	50	50	50
R^2	0.227	0.241	0.365	0.394	0.570	0.603	0.604	0.682
Adjusted R^2	0.194	0.191	0.308	0.325	0.510	0.536	0.526	0.610
Note:								*p<0.1; **p<0.05; ***p<0.01

Interpretation of Results 1/3

- The above table shows that GDP has a negative effect on the adoption of cryptocurrencies in the initial regressions. Education shows a positive correlation in all such as savings and Gini index. Economic Freedom, Latitude as well as the Social Cohesion index have a negative correlation. Genetic diversity has a positive effect.
- This means that if education increases by 1 point then the adoption of cryptocurrencies will increase by 0.082 points. In addition, if social cohesion increases by 1 point then the adoption of cryptocurrencies will decrease by 1.414 points and so on.

Interpretation of Results 2/3

- We understand that in societies where intense inequalities prevail, people turn to more risky investments in order to emerge. In contrast, in countries where there is social cohesion, economic freedom and a generally high standard of living (mainly countries that are quite far from equator), people prefer safer investments.
- This fact is confirmed by the literature which states that in developed countries people invest in the stock market which is considered to show less fluctuations.

Interpretation of Results 3/3

- Population diversity is highly stastistical significant. This makes sense since it comes from the past and largely reflects the present.
- According to other studies, when diversity increases, the probability of participating in the stock market also increases and has a strong influence on decisions related to high-risk assets.

Regressions

Behavioral Factors

	Dependent variable:									
	Crypto Adoption									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
GDP	-1.785	-5.097*	-5.570**	-1.083	-2.316	-2.447	-2.036	-2.533	-5.911**	-4.297
	(2.202)	(2.816)	(2.509)	(2.844)	(3.542)	(3.057)	(2.767)	(2.551)	(2.302)	(2.529)
Education	0.082***	0.096***	0.070***	0.098***	0.093***	0.093***	0.085***	0.080***	0.095***	0.090***
	(0.014)	(0.018)	(0.020)	(0.018)	(0.020)	(0.020)	(0.019)	(0.017)	(0.015)	(0.017)
Savings	0.194	-0.044	-0.032	0.044	0.045	0.057	-0.074	0.043	-0.365*	-0.065
	(0.118)	(0.210)	(0.197)	(0.214)	(0.224)	(0.229)	(0.234)	(0.154)	(0.211)	(0.208)
GiniIndex	33.955*	75.330**	33.372	72.014***	45.954**	43.299*	32.742	45.643**	65.635**	67.716**
	(18.293)	(27.488)	(32.483)	(25.820)	(21.766)	(25.380)	(23.035)	(20.142)	(23.491)	(26.971)
Economic Freedom	-0.389	0.001	-0.158	-0.231	-0.462	-0.479*	-0.622**	-0.389	-0.224	-0.052
	(0.237)	(0.280)	(0.248)	(0.293)	(0.276)	(0.271)	(0.282)	(0.247)	(0.232)	(0.261)
Social Cohesion	-1.414***	-1.478***	-1.477***	-1.307***	-1.366***	-1.365***	-1.198***	-1.395***	-0.976**	-1.435***
	(0.357)	(0.377)	(0.356)	(0.382)	(0.465)	(0.447)	(0.399)	(0.377)	(0.373)	(0.377)
Latitude	-0.176	-0.174	-0.156	-0.204	-0.149	-0.170	-0.209	-0.157	-0.194	-0.100
	(0.150)	(0.160)	(0.146)	(0.192)	(0.206)	(0.208)	(0.196)	(0.182)	(0.136)	(0.165)
Diversity(a.a.)	15,019.820***	23,235.340***	21,916.650***	16,671.840***	16,648.940**	16,131.260***	13,950.700**	17,348.070***	24,687.180***	20,408.910***
	(4,806.738)	(5,231.040)	(4,806.313)	(5,435.120)	(6,115.669)	(5,728.493)	(5,755.986)	(5,245.715)	(4,536.554)	(5,690.487)
Diversity sqrt(a.a.)	-10,602.280***	-16,393.570***	-15,493.600***	-11,742.500***	-11,773.140**	-11,410.510***	-9,875.935**	-12,264.390***	-17,494.770***	-14,438.120***
	(3,385.968)	(3,682.435)	(3,392.065)	(3,841.632)	(4,317.800)	(4,049.607)	(4,067.977)	(3,704.753)	(3,205.033)	(4,010.015)
Trust		-5.143								
		(6.919)								
Patience			11.754*							
			(6.469)							
Power Distance				0.207*						
				(0.120)						
Individualism					-0.022					
					(0.135)					
Masculinity						-0.016				
						(0.089)				
Uncertainty Avoidance							-0.138			
							(0.099)			
Long-term Orientation								0.082		
								(0.078)		
Risktaking									21.195**	
									(7.692)	
Altruism										3.824
										(5.226)
Constant	-5,318.505***	-8,266.565***	-7,703.715***	-5,996.509***	-5,897.705**	-5,709.106***	-4,904.031**	-6,133.700***	-8,724.635***	-7,239.574***
	(1,694.977)	(1,847.593)	(1,693.209)	(1,911.351)	(2,158.553)	(2,012.712)	(2,029.631)	(1,844.132)	(1,593.840)	(2,008.700)
Observations	50	34	34	43	43	43	43	45	34	34
R^2	0.682	0.808	0.828	0.702	0.675	0.675	0.694	0.704	0.852	0.808
Adjusted R^2	0.610	0.725	0.753	0.609	0.574	0.574	0.598	0.617	0.788	0.725
Note:										*p<0.1; **p<0.05; ***p<0.01

Interpretation of Results 1/3

- The above table shows that Patience has a positive effect in the Adoption of Cryptocurrencies such as Power Distance and Risk Taking.
- This means that if patience increases by 1 point then the adoption of cryptocurrencies will increase by 11.754 points. Moreover, if power distance increases by 1 point then the adoption of cryptocurrencies will increase by 0.207 points and if risk taking increase by 1 point then the dependent variable will increase by 21.195 points.

Interpretation of Results 2/3

- About patience, cryptos require users not to be stressed by the sharp fluctuations in this market and to have the so-called Diamond hands when required.
- Compared to the literature, patience has been associated with the stock market in which it is one of the most key factors in achieving success. Based on our results, the same is true in the cryptocurrency market.
- As Warren Buffett makes clear "The stock market is designed to transfer money from the active to the patient".

Interpretation of Results 3/3

- According to literature, the higher the power distance of a country the lower bitcoin penetration on that country.
- In our case the opposite happens. This can be explained given that the higher power distance the higher the passion of government to regulate crypto. For example, although the possession of cryptocurrencies has been banned in Nigeria, participation in them is high.
- Moreover, risk taking is a key factor in financial market based on literature.

Regressions

Folklore

	Dependent variable:					
	Crypto Adoption					
	(1)	(2)	(3)	(4)	(5)	(6)
GDP	-2.099	-3.208	-1.899	-2.629	-2.277	-3.067
	(2.282)	(2.439)	(2.575)	(2.538)	(2.318)	(2.276)
Education	0.096***	0.093***	0.095***	0.099***	0.097***	0.093***
	(0.014)	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)
Savings	0.255**	0.258**	0.248*	0.246*	0.229*	0.250**
	(0.126)	(0.125)	(0.133)	(0.128)	(0.134)	(0.122)
GiniIndex	49.914**	46.979**	49.899**	49.529**	49.132**	48.262**
	(18.552)	(18.590)	(18.770)	(18.737)	(18.738)	(18.043)
Economic Freedom	-0.408	-0.450*	-0.425	-0.394	-0.440*	-0.489*
	(0.252)	(0.252)	(0.272)	(0.255)	(0.259)	(0.248)
Social Cohesion	-1.268***	-1.251***	-1.276***	-1.284***	-1.289***	-1.302***
	(0.385)	(0.383)	(0.392)	(0.390)	(0.390)	(0.375)
Latitude	-0.255*	-0.264*	-0.249*	-0.245*	-0.240*	-0.223
	(0.136)	(0.136)	(0.142)	(0.139)	(0.139)	(0.133)
Challenge succesful		203.320				
		(164.770)				
Antisocial not punished			-22.987			
			(130.513)			
Antisocial punished				65.521		
				(132.115)		
Tricksters punished					62.918	
					(103.938)	
Challenge Competition						219.832*
						(117.386)
Constant	-38.877*	-27.430	-37.050	-41.428*	-34.065	-31.589
	(22.048)	(23.795)	(24.602)	(22.836)	(23.596)	(21.769)
Observations	50	50	50	50	50	50
R^2	0.603	0.617	0.603	0.605	0.606	0.634
Adjusted R^2	0.536	0.542	0.525	0.528	0.529	0.563
Note:						*p<0.1; **p<0.05; ***p<0.01

Interpretation of Results 1/2

- The above table shows that Challenge Competition has a positive effect on the adoption of cryptocurrencies.
- This means that if challenge competition increases by 1 point then the adoption of cryptocurrencies will increase by 219.832 points.
- Challenge Competition is related to the degree of competitiveness of countries today. So we understand that the more competitive a country is, the more likely it is to participate in the market.

Interpretation of Results 2/2

- According to the literature, competition in fairy tales predicts higher risk taking in countries today. As mentioned above, risk-taking is directly related to the purchase of cryptocurrencies.
- This fact is confirmed by the literature which states that in developed countries people invest in the stock market which is considered to show less fluctuations.

Conclusion 1/4

- Investments in the cryptocurrency market vary considerably between countries. The data from this study show that countries with strong social and economic inequalities are more likely to choose this market.
- In particular, countries with low incomes, strong inequalities, limited economic freedoms (high taxes, high debts, investment restrictions), low social cohesion (crime, violence, pessimism, suicides, inequalities, poor health, etc.) turn to cryptocurrencies in order to overcome poverty and difficulties and to emerge through risky projects.

Conclusion 2/4

- Furthermore, it has been studied that when the diversity of the population increases, the probability of participating in cryptocurrencies increases, as it does with the stock market according to other studies.
- The effect of this variable is particularly important and seems to explain our dependent variable better than the other variables, since it comes from the past and is directly related to the income and wealth that the literature identifies as important determinants of financial risk.
- It was also estimated that there is a negative causal relationship between the adoption of cryptocurrencies and the distance of countries from equator.

Conclusion 3/4

- In particular, in countries far from equator where they have a higher standard of living and a low rate of inequality, people are happier and more creative and do not turn to this market.
- It was also found that countries with a strong sense of risk-taking tend to invest in cryptocurrencies, where it is a risky market with strong fluctuations.
- These countries are also known for their patience and ability to handle stressful situations such as price fluctuations, which is essential for this market.

Conclusion 4/4

- Concluding our analysis, the effect of tradition on the present was examined and it was found that in countries where the fairytales of the past referred to competition - a fact that has positively affected the competitiveness of countries today according to the literature - there is high participation in crypto, too.
- Our results show that behavioral and historical factors significantly influence the modern, economic world and investment risk. Comparing the stock market and the cryptocurrency market, there are significant differences in the living standards of countries but also similarities related to risk-taking.