

Cryptocurrencies and gender gaps in financial inclusion

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Keywords: Gender Gap; Cryptocurrency; financial literacy; digital literacy

Blockchain and cryptocurrencies are a two-faced Janus: on one hand they are considered a tool to foster financial inclusion (Rella, 2019), having the potential to open up the financial system, improving the degree of inclusion for the most marginalised subjects from the financial infrastructure (i.e., the use of blockchain to facilitate more efficient, secure and transparent cash aid in conflict zones by the U.N. World Food Programme); on the other hand, their complexity has raised concerns due to their accessibility and their potential to perpetuate inequalities in financial inclusion when they do not automatically benefit all equally (United Nations, 2018; Di Vaio et al., 2022). In fact, the adoption of blockchain and cryptocurrencies would generate more inequalities due to the persistent gender inequalities both in access to technologies, digital education (for the EU see EU Commission's Report on Closing the Gender Digital Divide; 2019/2168 - INI) and in financial literacy (Bottazzi and Lusardi, 2021). However, little attention has been paid to the link between blockchain and cryptocurrencies and gender. Using OECD-INFE 2023 microdata, our analysis aims to provide new insights on the gender gaps in the digital financial literacy and the use of cryptocurrencies and crypto assets to underline the potential risks of gender blindness in the analyses of cutting-edge technological innovation in finance.



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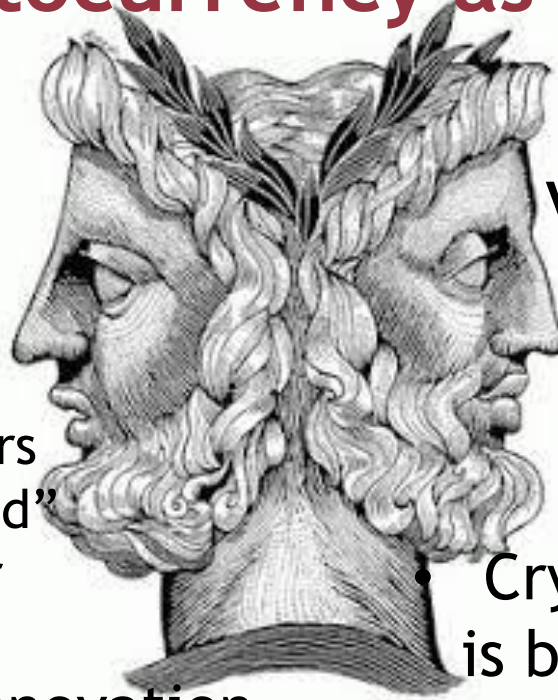
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Cryptocurrency as Janus

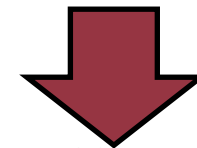


cryptocurrency as

- a hedge against hyperinflation
- a tool for financial inclusion
 - lowers financial barriers by reaching the “unbanked”
 - offers new avenues for economic empowerment
- a **gender-neutral** innovation for women, access to cryptocurrency as a means to
 - accrue **independent** wealth,
 - circumvent **discriminatory** finance practices
 - escape situations of domestic abuse

data suggest that **women/minorities** have largely been **left out** of this economic transformation

• Cryptocurrency innovation is built over **existing social hierarchies**, reinforcing inequalities



**calls for
feminist analysis**

Empirical analysis

gendered analysis to further investigate the specific “promises” of cryptocurrency as a tool for financial inclusion

the promise of participation

Has the cryptocurrency industry become deeply entwined with masculinity, excluding women as investors/users?

the promise of lowering financial barriers

Are cryptocurrency's awareness knowledge and use gender-neutral?

the promise of empowerment through financial freedom

Has cryptocurrency reduced financial dependence and increased women's ability to control their own wealth/financial resources?

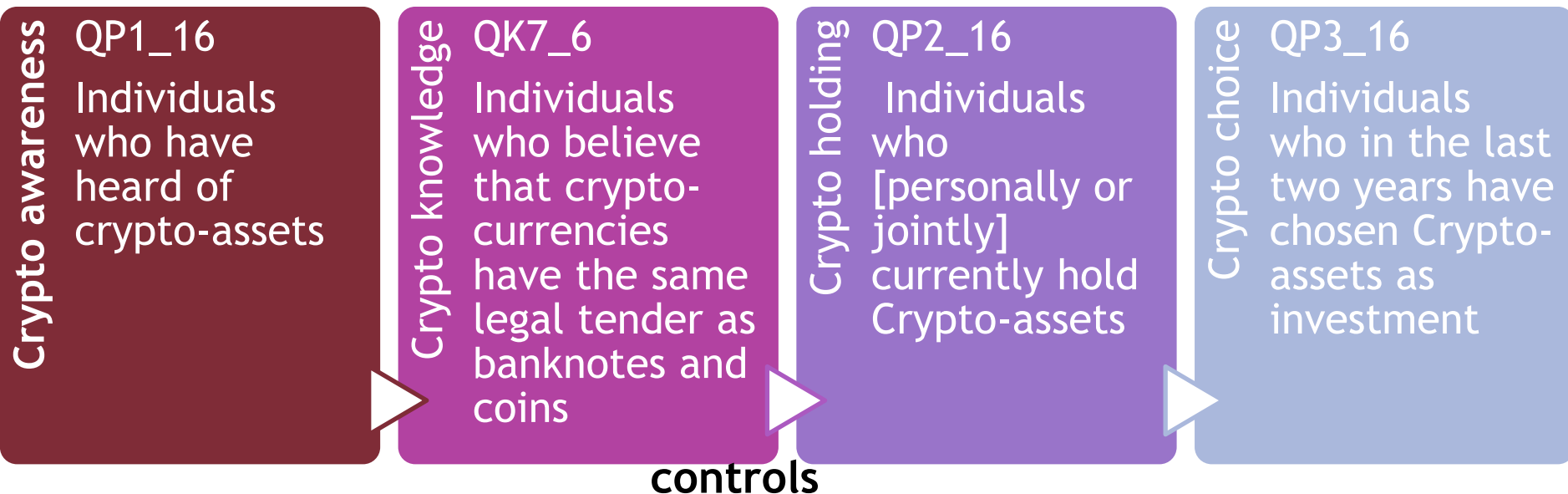
Microdata

OECD/International Network on
Financial Education (INFE) survey
analysed *under a new light*



- Information about *financial behaviour, attitudes, and knowledge* to assess levels of *financial literacy and financial inclusion*.
- Last wave available (2023)
- **15,019** responses from **9** European countries who agreed to disclose data for research purposes
- Croatia; Estonia; France; Greece; Hungary; Ireland; Italy; Latvia; Lithuania
- Participating economies surveyed more than 1,000 adults aged 18 and above.
- **Advantages:**
 - extensive nature;
 - indirect measurement;
 - focus on personal situation.
- **Disadvantages:**
 - poor account of interpersonal dynamics and violence relationships;
 - unbalanced geographical coverage.

Cryptocurrency with OECD/INFE data



- ☐ gender
- ☐ age
- ☐ family status (single; with dependent child(ren) in the household)
- ☐ education (6 levels) employment status (employed, inactive)
- ☐ income level (3 levels)
- ☐ financial products in the portfolio
- ☐ Financial behaviors - at risk of financial dependency

the promise of participation

- Has cryptocurrency industry become deeply entwined with masculinity, excluding women as investors/users?

	all %	men %	women %
Crypto awareness	43.11	46.31	40.03
Crypto knowledge	46.17	50.55	41.95
Crypto holding	2.73	4.19	1.32
Crypto choice	2.15	3.25	1.10

	male %	women %
Crypto awareness	52.68	47.32
Crypto knowledge	53.69	46.31
Crypto holding	75.36	24.64
Crypto choice	73.94	26.06

the promise of lowering financial barriers

- Are cryptocurrency's awareness knowledge and use gender neutral?

Probability of being **aware** of crypto assets - probit marginal effect

	(1)	(2)	(3)	(4)	(5)	(6)
woman	-0.0614*** (0.00700)	-0.0626*** (0.00697)	-0.0651*** (0.00692)	-0.0589*** (0.00698)	-0.0578*** (0.00765)	-0.0578*** (0.00756)
age	-0.00521*** (0.000201)	-0.00484*** (0.000207)	-0.00475*** (0.000204)	-0.00428*** (0.000213)	-0.00435*** (0.000246)	-0.00402*** (0.000245)
single		-0.0162* (0.00895)	-0.0104 (0.00886)	-0.0112 (0.00882)	0.0121 (0.00975)	0.0103 (0.00966)
dependent child(ren)		0.0643*** (0.00953)	0.0609*** (0.00959)	0.0536*** (0.00965)	0.0321*** (0.0108)	0.0316*** (0.0105)
education			0.0589*** (0.00374)	0.0577*** (0.00375)	0.0552*** (0.00414)	0.0598*** (0.00412)
employed				0.0591*** (0.00772)	0.0339*** (0.00878)	0.0335*** (0.00867)
inactive				-0.0724*** (0.0181)	-0.0550*** (0.0206)	-0.0523** (0.0204)
income					0.0586*** (0.00557)	0.0590*** (0.00543)
No savings or investments						0.162*** (0.00890)
Country controls	YES	YES	YES	YES	YES	YES
Observations	15,019	15,019	14,983	14,983	12,153	12,153

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

the promise of lowering financial barriers

- Are cryptocurrency's awareness knowledge and use gender neutral?

Probability of having crypto **knowledge** - probit marginal effect

	(1)	(2)	(3)	(4)	(5)	(6)
woman	-0.0804*** (0.00760)	-0.0811*** (0.00760)	-0.0822*** (0.00759)	-0.0790*** (0.00766)	-0.0904*** (0.00845)	-0.0904*** (0.00845)
age	-0.00120*** (0.000231)	-0.00101*** (0.000236)	-0.000962*** (0.000236)	-0.000527** (0.000246)	-0.00101*** (0.000284)	-0.00101*** (0.000285)
single		-0.00433 (0.00997)	-0.00163 (0.00996)	-0.00159 (0.00994)	0.00835 (0.0111)	0.00840 (0.0111)
dependent child(ren)		0.0384*** (0.0104)	0.0378*** (0.0104)	0.0301*** (0.0105)	-0.00404 (0.0119)	-0.00402 (0.0119)
education			0.0391*** (0.00409)	0.0383*** (0.00409)	0.0399*** (0.00451)	0.0397*** (0.00452)
employed				0.0531*** (0.00866)	0.0295*** (0.00993)	0.0296*** (0.00993)
inactive				-0.0151 (0.0190)	-0.00878 (0.0218)	-0.00886 (0.0218)
income					0.0306*** (0.00634)	0.0306*** (0.00633)
No savings or invest.s						-0.00415 (0.0108)
country controls	YES	YES	YES	YES	YES	YES
Observations	15,019	15,019	14,983	14,983	12,153	12,153

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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- Are cryptocurrency's awareness knowledge and use gender neutral?

Probability of currently **holding** crypto assets - probit marginal effect

	(1)	(2)	(3)	(4)	(5)	(6)
woman	-0.0298*** (0.00293)	-0.0297*** (0.00294)	-0.0301*** (0.00294)	-0.0296*** (0.00295)	-0.0337*** (0.00349)	-0.0338*** (0.00349)
age	-0.00128*** (8.93e-05)	-0.00128*** (8.92e-05)	-0.00127*** (8.93e-05)	-0.00126*** (9.11e-05)	-0.00148*** (0.000110)	-0.00148*** (0.000110)
single		0.000850 (0.00334)	0.00136 (0.00334)	0.00137 (0.00333)	0.00441 (0.00400)	0.00453 (0.00401)
dependent child(ren)		4.76e-05 (0.00318)	-0.000203 (0.00320)	-0.000664 (0.00324)	-0.00226 (0.00375)	-0.00212 (0.00375)
education			0.00747*** (0.00153)	0.00698*** (0.00154)	0.00641*** (0.00187)	0.00612*** (0.00186)
employed				0.00547* (0.00288)	0.000393 (0.00346)	7.73e-05 (0.00346)
inactive				-0.0220** (0.0107)	-0.0198 (0.0122)	-0.0195 (0.0122)
income					0.0107*** (0.00233)	0.0105*** (0.00232)
No savings or invest.s						-0.00889** (0.00384)
country controls	YES	YES	YES	YES	YES	YES
Observations	15,019	15,019	14,983	14,983	12,153	12,153
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

the promise of lowering financial barriers

- Are cryptocurrency's awareness knowledge and use gender neutral?

Probability of **choosing** crypto assets as inv. in the last 2 years- probit m.e.

	(1)	(2)	(3)	(4)	(5)	(6)
woman	-0.0227*** (0.00259)	-0.0228*** (0.00261)	-0.0230*** (0.00261)	-0.0226*** (0.00260)	-0.0245*** (0.00303)	-0.0247*** (0.00302)
age	-0.00113*** (8.25e-05)	-0.00113*** (8.26e-05)	-0.00113*** (8.29e-05)	-0.00113*** (8.55e-05)	-0.00132*** (0.000104)	-0.00133*** (0.000104)
single		-0.00282 (0.00311)	-0.00256 (0.00311)	-0.00246 (0.00309)	-6.67e-05 (0.00362)	1.68e-05 (0.00362)
dependent child(ren)		-8.18e-05 (0.00278)	-0.000274 (0.00279)	-0.000854 (0.00283)	-0.00165 (0.00322)	-0.00146 (0.00323)
education			0.00474*** (0.00136)	0.00407*** (0.00138)	0.00342** (0.00167)	0.00316* (0.00167)
employed				0.00698*** (0.00259)	0.00407 (0.00309)	0.00357 (0.00306)
inactive				-0.0254** (0.0113)	-0.0240* (0.0128)	-0.0235* (0.0127)
income					0.00821*** (0.00213)	0.00792*** (0.00212)
No savings or invest.s						-0.00941*** (0.00324)
country controls	YES	YES	YES	YES	YES	YES
Observations	15,019	15,019	14,983	14,983	12,153	12,153

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

the promise of empowerment through financial freedom

- Has cryptocurrency reduced financial dependence and increased women's ability to control their own wealth/financial resources?

How do we quantify financial freedom?

Variables	Description
At risk of financial dependency (if at least 2 indicators are 1)	
Impossibility to survive a financial shock	=1 if the responder answers “No” or “Don’t know” when asked if she (personally) would be able to face an expenditure shock without borrowing the money or asking family or friends to help (QF4)
No decisions	=1 if the responder answers “someone else makes these decisions” or “Don’t know” to the question “who is responsible for making day-to-day decisions about money in the household” (QF1)
No plans for retirement	=1 if the responder answers “not at all confident” or “Don’t know” to the question on the confidence of making financial plans for retirement (QF8)

the promise of empowerment through financial freedom

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Probability of **being at risk of financial dependency** - probit m.e. ALL

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
women	0.0453*** (0.00608)	0.0459*** (0.00608)	0.0472*** (0.00607)	0.0308*** (0.00635)	0.0308*** (0.00635)	0.0294*** (0.00639)	0.0297*** (0.00636)	0.0293*** (0.00638)
age	-0.00309*** (0.000188)	-0.00320*** (0.000189)	-0.00323*** (0.000189)	-0.00310*** (0.000204)	-0.00309*** (0.000205)	-0.00315*** (0.000206)	-0.00315*** (0.000206)	-0.00316*** (0.000206)
single		-0.00383 (0.00791)	-0.00626 (0.00792)	-0.0360*** (0.00819)	-0.0362*** (0.00819)	-0.0361*** (0.00819)	-0.0362*** (0.00818)	-0.0361*** (0.00818)
Dep. child(ren)		-0.0287*** (0.00815)	-0.0281*** (0.00810)	0.0138 (0.00879)	0.0138 (0.00879)	0.0132 (0.00879)	0.0133 (0.00880)	0.0131 (0.00879)
education			-0.0330*** (0.00350)	-0.0262*** (0.00348)	-0.0260*** (0.00348)	-0.0257*** (0.00349)	-0.0258*** (0.00349)	-0.0257*** (0.00349)
employed				-0.0773*** (0.00487)	-0.0773*** (0.00486)	-0.0767*** (0.00486)	-0.0768*** (0.00486)	-0.0767*** (0.00486)
income				-0.0704*** (0.00720)	-0.0705*** (0.00720)	-0.0709*** (0.00720)	-0.0709*** (0.00719)	-0.0710*** (0.00719)
No savings or inv.s					0.00729 (0.00825)	0.00687 (0.00826)	0.00692 (0.00826)	0.00684 (0.00826)
crypto_holding						-0.0524** (0.0209)		-0.0329 (0.0279)
crypto_choice							-0.0578** (0.0238)	-0.0310 (0.0317)
country controls	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	15,019	15,019	14,983	12,153	12,153	12,153	12,153	12,153
Standard errors in parentheses			*** p<0.01, ** p<0.05, * p<0.1					

the promise of empowerment through financial freedom

Has cryptocurrency reduced financial dependence and increased women's ability to control their own wealth/financial resources?

Probability of **being at risk of financial dependency** - probit m.e. **WOMEN**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		-	-	-	-	-	-	-	-
age	-0.00325*** (0.000271)	0.00336*** (0.000276)	0.00341*** (0.000275)	0.00291*** (0.000299)	0.00352*** (0.000303)	0.00351*** (0.000304)	0.00353*** (0.000305)	0.00356*** (0.000305)	0.00355*** (0.000305)
single		-0.0177 (0.0118)	-0.0205* (0.0119)	-0.0504*** (0.0125)	-0.0479*** (0.0124)	-0.0479*** (0.0124)	-0.0479*** (0.0124)	-0.0480*** (0.0124)	-0.0480*** (0.0124)
Dep. child(ren)		-0.0357*** (0.0118)	-0.0351*** (0.0118)	0.00104 (0.0128)	0.00635 (0.0128)	0.00638 (0.0128)	0.00626 (0.0128)	0.00595 (0.0128)	0.00591 (0.0128)
education			-0.0288*** (0.00518)	-0.0260*** (0.00533)	-0.0255*** (0.00522)	-0.0255*** (0.00522)	-0.0255*** (0.00522)	-0.0255*** (0.00522)	-0.0255*** (0.00522)
employed				-0.0875*** (0.00720)	-0.0800*** (0.00720)	-0.0800*** (0.00720)	-0.0798*** (0.00720)	-0.0797*** (0.00720)	-0.0798*** (0.00719)
income					-0.0838*** (0.0108)	-0.0839*** (0.0108)	-0.0840*** (0.0108)	-0.0842*** (0.0108)	-0.0842*** (0.0108)
No sav. or in.s						0.00140 (0.0123)	0.00113 (0.0123)	0.000865 (0.0123)	0.000962 (0.0123)
crypto_holding							-0.0284 (0.0434)		0.0314 (0.0612)
crypto_choice								-0.0680 (0.0471)	-0.0925 (0.0668)
country contr.s	YES	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	7,692	7,692	7,673	6,177	6,177	6,177	6,177	6,177	6,177
Standard errors in par.			*** p<0.01, ** p<0.05, * p<0.1						

Final thoughts

empirical gendered analysis for 9 European countries

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Thank you!
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