

# Women Teachers and Their Long-Term Savings Approach on Cryptocurrency Investment

A. Ruban Christopher<sup>1</sup>\* and A. R. Nithya<sup>2</sup>

<sup>1</sup>*School of Management, Hindustan Institute of Technology and Science, Chennai, India*

**Keywords:** Cryptocurrency, Women Teachers, Long-Term Savings.

**Abstract:** Enabling women empowered on cryptocurrency leverages them with greater control over their financial assets with financial independence. Recently published research data shows that only 20+ percentage of crypto investors in India are women. This gender gap in the cryptocurrency market may be due to a variety of factors; This research identifies the variables that has a significant relationship on the cryptocurrency investment by women, particularly the women teachers. An empirical study is conducted via a questionnaire, administered online. The data is analysed in Python, a machine learning software, executed in 'feature importance' method using decision tree analysis and output results are validated by 'catboost' algorithm. The interpretations highlight the six independent variables that show significant relationship on cryptocurrency investment by women teachers are namely; monthly income, long-term investment behaviour, educational stream, perceived profit in crypto investment, percentage of long-term savings in cryptocurrency and their willingness to participate in training.

## 1 INTRODUCTION

India stood fifth in the world on the number of crypto owners as a percentage of the total population with 19.30% and third in terms of volume with 27.45 crore accounts as of Nov 2022 report by Finder's Cryptocurrency Adoption Index. The total value of the cryptocurrency market capital as of early 2023 is around Rs.100 lakh crores. Considering the quantum of money getting invested, having women involved in cryptocurrency can help address the gender gap in the technology industry and can also help to promote inclusivity in the cryptocurrency space. Moreover, having women made aware of cryptocurrency can empower them by providing the knowledge and tools to participate in the growing digital economy. Additionally, understanding cryptocurrency can help women to make informed decisions about the technology and its potential uses and risks. Furthermore, it can help to break down barriers and to increase the participation of women in the cryptocurrency industry, which can lead to a more diverse and equitable ecosystem. In this study we

shall discuss on the long-term savings approach of the Women Teachers on Cryptocurrency.


## 2 REVIEW OF LITERATURE


### 2.1 Risk Factor

(Prasetyo, T.G. and Kurniasari, F., 2023) (Prasetyo and Kurniasari, 2023) study affirms that Women are more likely than men to invest in crypto assets due to the blockchain system's security, transparency, and ease of use. (Prapatchon Jariyapan et al, 2022) (Prapatchon Jariyapan et al., 2022) This study concluded that, the cryptocurrency asset ownership was based on the perceived usefulness of it and not on its risk consideration.

### 2.2 Financial Literacy or Awareness

(Samaira Tomer, 2022) (International Journal of Advanced Research, n.d.) As per primary data collected, around 85% do not invest in

<sup>1</sup>  <https://orcid.org/0009-0003-5081-3640>

<sup>2</sup>  <https://orcid.org/0000-0002-9051-4317>

\* Corresponding Author

cryptocurrency due to the widespread misinformation and their risk-averse behavior. (Kim, Kyoung Tae, 2022) (Kim et al., 2022) study shown that objective investment literacy was negatively associated while subjective literacy was positively associated with holding cryptocurrency.

### 2.3 Prior Investment Experience

(Chrančoková, Martina et al ,2022) (Chrančoková et al., 2022) study states that, People who actively invested in cryptocurrencies cite that the possibility of quick earnings as the main reason for investing in cryptocurrencies, whereas the respondents who did not invest commented that it is very high risk. Most investors are from the city, men and with inverse relationship on age.

### 2.4 Government Regulations

(Anu Bala, 2022) (Researchers, n.d.) Discussed that currently there is no legislation that bans cryptocurrency as illegal and it sends a positive signal and encourages investment in cryptocurrency. (Shukla, S., & Akshay, A. 2019) (Anu Bala, 2022) found that, the majority of the people would like to invest in the same if only if the Government of India regulates its use and control.

### 2.5 As a Payment Tool

(Zühal Yurtsizoğlu & Kerim Ali Akgül, 2022) (Swathy Shukla and Akshay A, 2019) this study noted that the crypto currency system became an investment tool and was even adopted as a national currency in many nations. (Samiullah Jahan Shaikh, 2021) (Yurtsizoğlu and Akgül, 2022) It observed that the willingness to adapt cryptocurrencies as an alternative payment option increased especially when Tesla accepted Bitcoins, in Urban areas.

### 2.6 Other Factors

(Aleksander Berentsen and Fabian Schär, 2018) (Samiullahjahan Shaikh, 2021) concludes that, in the world of cryptocurrencies, eliminating the intermediary results in lower costs and lesser additional fees. This encourages people to invest and use cryptocurrency more often.

### 2.7 Research Gap

Many of the existing research literatures on the cryptocurrency investment are focusing on diverse

aspects like, Risk Factor, Financial Literacy or awareness, Prior investment Experience, Government Regulations, as a Payment tool and other factors like age, gender etc... and recommend that such of these research studies can be studied on other target samples or by different other variables.

## 3 OBJECTIVE

To analyze the relationship between long-term savings approach of the women teachers against their cryptocurrency Ownership.



Figure 1: Research Framework.

### Hypotheses

H1: There is a significant relationship between the Long-Term savings approach of the women teachers and with the cryptocurrency ownership.

## 4 RESEARCH METHODOLOGY

This Research design is based on the Descriptive Research method. The primary data with convenient sampling was sourced with the help of a structured survey questionnaire distributed via internet online to women teachers either from school or college including both government and private educational institutions limiting only to the city of Chennai. The total responses received were 272. The questionnaire was tested for intercorrelations reliability among its test items with Cronbach's Alpha  $\alpha = 0.72$  (acceptable standard). Secondary Data were also collected from the various research papers and web-based articles and existing research studies

### 4.1 Analysis and Results

The exploratory data analysis of the surveyed data is done using Python Programming Language to find the insights. Python software version-3.11.1-amd64

is used with Anaconda (Jupyter Notebook) as a Platform. Some graphical analysis of the data from the dataset is shown in the output by using different libraries of Python like NumPy, Pandas, Seaborn, Matplotlib and Sklearn with inbuilt statistics API functions. Here, a dataset named 'Cryptocurrency\_file.csv' is used to analyse and

extract various information in both numerical as well as in pictorial form. First, Running the Chi-Square analysis to evaluate the relationship between all the available independent variables against the dependent variable of cryptocurrency ownership in Python using the machine language function 'chi2\_contingency'. we get the below result in [Fig 2].

```
Age_group ; Chi-square value: 5.17992277992278 ; p-value: 0.1590865565834152
nature_of_employment ; Chi-square value: 1.0038610038610039 ; p-value: 0.6053608805968682
PlaceofSchooling ; Chi-square value: 3.6913851351351346 ; p-value: 0.05469417766729621
highest_educational_Qualification ; Chi-square value: 0.8605734112490867 ; p-value: 0.8349303880420681
highest_educational_stream ; Chi-square value: 1.990990990990991 ; p-value: 0.7374159913261533
Place_of_collegeeducation ; Chi-square value: 0.0 ; p-value: 1.0
monthly_income_range ; Chi-square value: 5.727141102141102 ; p-value: 0.6777654743429105
Savings_from_monthly_income ; Chi-square value: 2.2069256756756754 ; p-value: 0.8190349706812783
savingspercentage_for_longterm ; Chi-square value: 7.629409672830726 ; p-value: 0.10613641334479905
longterm_savings_investment_strategy ; Chi-square value: 20.955052878965923 ; p-value: 0.00010756328276580776
Profitable_investing_in_stock_or_cryptocurrency ; Chi-square value: 16.33783783783784 ; p-value: 0.0009667316024323902
percentageof_longterm_savings_in_cryptocurrency ; Chi-square value: 21.657710651828296 ; p-value: 0.0006081340901434022
invest_in_cryptocurrency_this_year_2023 ; Chi-square value: 4.674227799227799 ; p-value: 0.096660605103477816
cryptocurrency_will_be_worth_more_or_less_than_today ; Chi-square value: 6.995085995085995 ; p-value: 0.07205456357969714
participate_in_training ; Chi-square value: 6.0930271964754725 ; p-value: 0.04752432478717647
attempt_to_trade_in_cryptocurrency_after_training ; Chi-square value: 3.257985257985258 ; p-value: 0.19612704734707015
```

Figure 2: Chi-Square output Python Console.

Table 1: Chi-Square Result Summary.

Variable Name	Chi-Square Value	Significance p-Value
Long term (LT) savings	20.955	0.0001
Profitability	16.337	0.0009
% of LT savings	21.658	0.0006
Attend Training	6.0930	0.0475

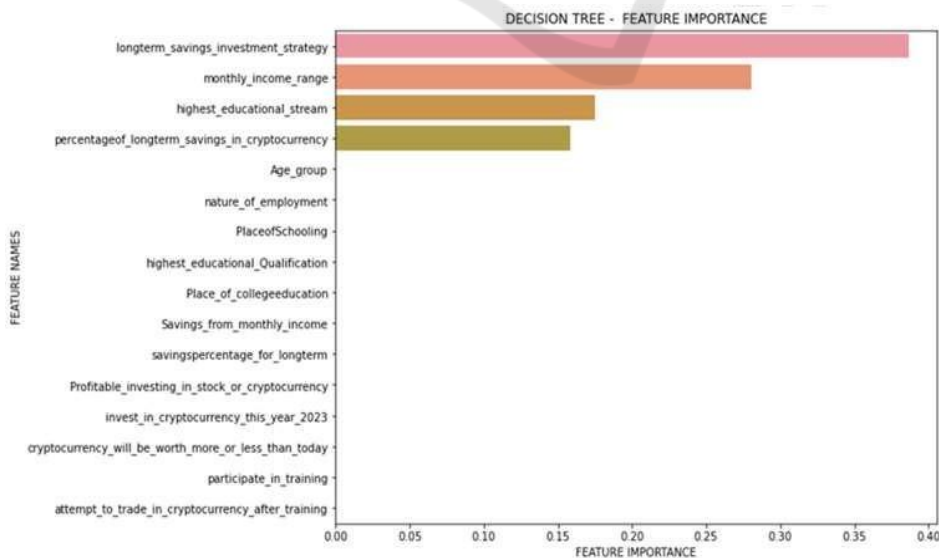


Figure 3: Decision Tree - Feature Importance Classifier output from Python console.

Table 2: Chi-Square result summary & Common Factors Details.

Variable Name	Prediction Power
long-term savings investment strategy	0.386524
Monthly income range	0.280226
Highest educational stream	0.175141
percentage of long-term savings in cryptocurrency	0.158109

Common Factors between Chi- Square results and Decision Tree - Feature Importance Classifier	
a) long-term savings investment strategy	b) percentage of long- term savings in cryptocurrency

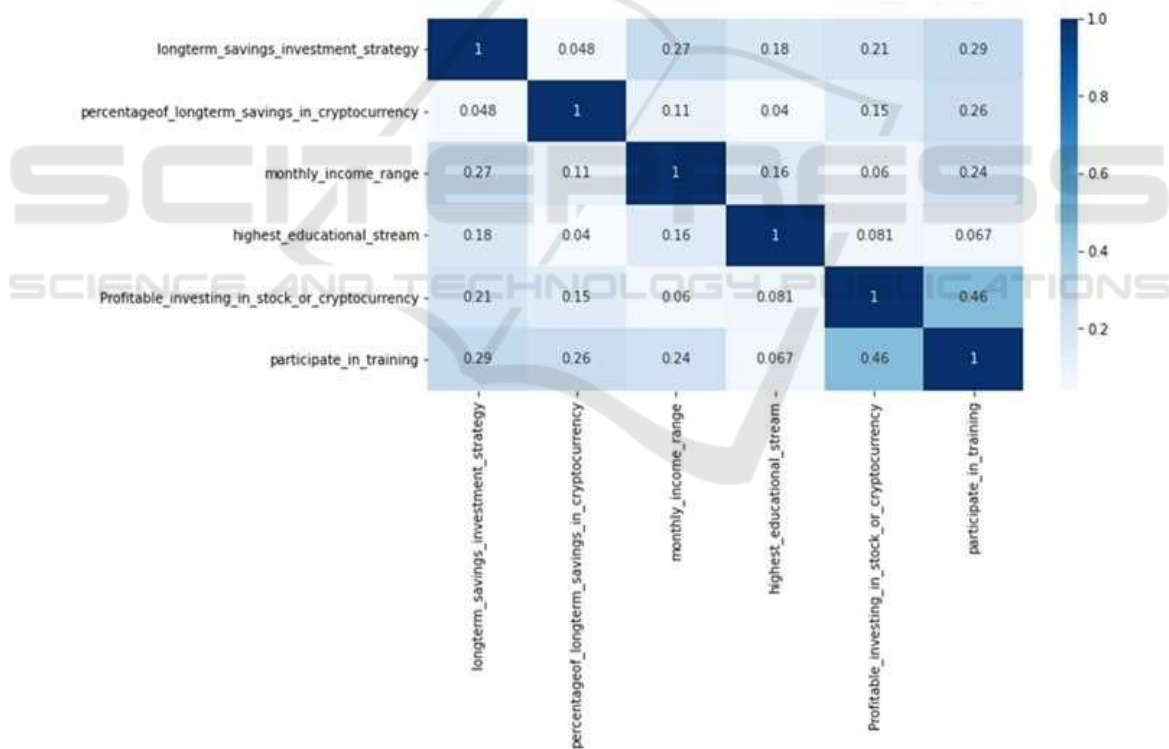


Figure 4: Correlation matrix output of the variables from Python console.

In order to interpret the results of a chi- squared test, a significance level needs to be chosen. The significance level is the probability threshold that is used to determine whether the results of a test are statistically significant or not. The widely accepted

and the most common significance level used in practice is < 0.05, which means that if the p- value of a test is less than 0.05, the results of the test are considered statistically significant and the null

hypothesis is rejected and accepts the alternative hypothesis.

From the above result, it shows that above 4 variables are significant as in [Table 1]. The larger the chi-squared test statistic, the more likely it is that the observed frequencies are different from the expected frequencies. Now, we try another approach called 'Feature importance using Decision tree classifier' to identify the variables responsible for crypto currency ownership. The output is given in a visualisation from as in [Fig 3] as well as in a tabular form [Table 2]. This second approach of identifying independent variables responsible for Crypto ownership using the feature importance result using Decision Tree classifier, gives us following 4 variables are significant. Comparing both the approaches [Chi-square and Decision tree classifier] for identifying the parameters which has an impactful relationship on crypto asset ownership, below are 2 features commonly showing Significance is given in [Table 3]. Finally, we wanted to confirm if there are any correlations exist between these six significant variables and we create the correlation matrix heatmap using Pearson method to find out connectedness amongst them in the below [Fig 4].

From the above matrix, it is obvious that none of the independent features are correlated with one another. Therefore, there is no biasedness. We also performed 'catboost' algorithm, based on gradient boosting decision trees to validate the factors identified above and got the results with 97.87% of accuracy. Hence our prediction model is more accurate.

To summarise the findings, data analysis using Python's statistical tools 1) Chi-square test, 2) Decision tree classifier 3) Correlation Matrix and 4) catboost algorithm we conclude that, the following six variables have more significance relationship that has an influence on the cryptocurrency investment are, 'long-term savings investment strategy', 'highest educational stream', 'percentage of long-term savings in cryptocurrency', 'monthly income range', 'Profitable investing in stock or cryptocurrency' and 'participate in training'.

Conclusion: This research study has provided an insight into the possible factors triaged to the cryptocurrency investment amongst the women teaching fraternity with their level of significant relationship. Similarly, Python language is also shown as a data analysis & visualization tool, further it can also be used for Quantitative modeling and Algorithmic trading in cryptocurrencies. This study is also helpful to investors choosing cryptocurrency as their long-term savings; especially women who are

more aggressive in savings as they tend to plan for their long-term investment when it comes to retirement, due to their longer life expectancy, breaks in professional life, early retirement and most importantly gender pay gap.

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