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MACNINE LEARNING BASED ANALYSIS OF CRYPTOCURRENCY MARKET FINANCIAL RISK MANAGEMENT

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ABSTRACT

Cryptocurrency is one of the famous financial state in all over the world which cause several type of risks that effect on the intrinsic assessment of risk auditors. From the beginning the growth of cryptocurrency gives the financial business with the wide risk in term of presentation of money laundering. In the institution of financial supports such as anti-money laundering, banks and secrecy of banks proceed as a specialist of risk, manager of bank and officer of compliance which has a provocation for the related transaction through cryptocurrency and the users who hide the illegal funds.In this study, the Hierarchical Risk Parity and unsupervised machine learning applied on the cryptocurrency framework. The process of professional accounting in term of inherent risk connected with cryptocurrency regarding the occurrence likelihood and statement of financial impact. Determining cryptocurrency risks comprehended to have a high rate of occurrence likelihood and the access of private key which is unauthorized. The professional cryptocurrency experience in transaction cause the lower risk comparing the less experienced one. The Hierarchical Risk Parity gives the better output in term of returning the adjusted risk tail to get the better risk management result.The result section shows the proposed model is robust to various intervals which are re-balanced and the co-variance window estimation.

I.INTRODUCTION

Financial market is one of the complex systems that the definition of complexity didn't get accepted from universities and this cause the agreement in term of interacting the elements of complex systems together. Complex system modeling is similar to daunting task which the structure of this system organized based on hierarchical manner that collected their own subsystems [1]_[3].This resources extracted by the name of hierarchical models. Unfortunately, in the process of portfolio construction there is a hug challenge regarding the lack of correlation matrix in hierarchical structure.This issue worsen the matrices for large covariance. In recent decades, around 2500 type of crypto currencies which contains the 252.5 trillion dollar of trading in this market [4]_[6]. The cryptocurrency reverberation transpire in, out of order environment [7]_[10]. Even news publishers had more interest and closer attention to the price changes and the large remote of actions to the soar unmitigated.Rules set up is for investors protecting and try to stop the money laundry. Similarly, stop the crowd for the _at currency. Regarding all the mentioned good wills, implementation and theories shows the dedicated movement of price of crypto currency market. Lahre *et al.* [11] propose the strategy of Hierarchical Risk Parity (HRP) on the multi-asset multi-factor allocation which achieves the good results on tail risk. Moreover, Jain *et al.* [12]

applied the same strategy for the individual stocks to comport the nifty indexes of NIFTY. Raf_not *et al.* [13], compares different varients of HRP (HERC and HCCA) and evaluates the performance of them. Brauneis *et al.* [14] uses the mean-variance framework to analyze the portfolios of crypto currency based on the Markowitz optimization with the high ratio. Walid *et al.* [15] proposed the relationship between crypto currencies based on the highest frequency. The presented system gives the output of useful marketing insights and gives the allowance to the agent to improve the system stability. Platanakis *et al.* [16], demonstrates the estimation error in term of return estimation rather than naively diversified (1/N) strategy. Similarly, they used [17] the model of Black Litter man based on the variance constraints to support the sophisticated portfolio technique for estimation control of the simple methods to manage the crypto currency. Saba *et al.* [18] applied the wavelet-based analysis for crypto currency multi-scale dynamic interdependence between the liquid crypto currencies to count the traders and investors heterogeneous behaviour. Corbet *et al.* [19] compare the different rules of trading in term of average-oscillator to breakout the range of trading strategies.Based on the reports of crypto currency related audit considerations and Chartered Professional Accountants Canada (CPAC), building the general awareness for the intrinsic risks of the ecosystem of digital assets recommended. In 2018, the CPAC reported a list which shows the crypto currency special risks mentioned as below:

_ Choosing the exchange of crypto currency based on the entity contains no control on transactions and its overbalanced for the maintained account of the entity.

_ Crypto currency wallet which is belonging to the entity has no account.

_ Its not possible to access to crypto currency by loosing the private key.

_ If an unauthorized party get any access to the private key then all the crypto currency stolen.

_ Misrepresentation of private key of entity.

_ Sending the incorrect address from entity which is not possible of recovery from crypto currency.

_ The transactions of crypto currency get recorded from entity which has no identification possibility based on the anonymity of the transactions in block chain.

_ The crypto currency contains the delay of transactions in the end of period.

_ It become difficult to record the conditions and events for the financial purposes.

Some of the mentioned risks contain the higher likely-hood such as the private key which is belonging to only one person and its a secret number which gives the access to the block chain funds. By loosing this key getting access to the crypto currency contains the highest-impact risk which cause the delay in process of crypto currency. The main contribution of this research summarized as below:

_ Using the Hierarchical Risk Parity for the crypto currency portfolio based on the usage of machine learning techniques.

_ The proposed system is able to examine the professional accounting based on the associated risk of cryptocurrency and the impact which is expected from Financial statement.

_ Finding the intrinsic risk which are correlated negatively in the crypto currency.

_ Ranking the exchange level control risk based on the likelihood evaluation.

_ Finding the highest likelihood risk of the determined crypto currency.

The rest of the process is divided as follows: Section 2 represents the brief literature review related to risk management of crypto currency framework. Section 3 presents the systematic structure of the proposed risk management system. Section 4 presents the implementation process and development environment details. We conclude this paper in the conclusion section.

II. EXISTING SYSTEM

Lahre *et al.* [11] propose the strategy of Hierarchical Risk Parity (HRP) on the multi-asset multi-factor allocation which achieves the good results on tail risk. Moreover, Jain *et al.* [12] applied the same strategy for the individual stocks to comport the fifty indexes of NIFTY. Raf_not *et al.* [13], compares different varients of HRP (HERC and HCCA) and evaluates the performance of them. Brauneis *et al.* [14] uses the mean-variance framework to analyze the portfolios of cryptocurrency based on the Markowitz optimization with the high ratio.

Walid *et al.* [15] proposed the relationship between cryptocurrencies based on the highest frequency. The presented system gives the output of useful marketing insights and gives the allowance to the agent to improve the system stability. Platanakis *et al.* [16], demonstrates the estimation error in term of return estimation
rather than naively diversified (1/N) strategy. Similarly, they used [17] the model of Black Litterman based on the variance constraints to support the sophisticated portfolio technique for estimation control of the simple methods to manage the cryptocurrency. Saba *et al.* [18] applied the wavelet-based analysis for cryptocurrency multi-scale dynamic interdependence between the liquid cryptocurrencies to count the traders and investors heterogeneous behaviour. Corbet *et al.* [19] compare the different rules of trading in term of average-oscillator to breakout the range of trading strategies.

Disadvantages

1. Choosing the exchange of cryptocurrency based on the entity contains no control on transactions and its overbalanced for the maintained account of the entity.
2. Cryptocurrecy wallet which is belonging to the entity has no account.
3. Its not possible to access to cryptocurrency by loosing the private key.
4. If an unauthorized party get any access to the private key then all the cryptocurrency stolen. Misrepresentation of private key of entity.
5. Sending the incorrect address from entity which is not possible of recovery from cryptocurrency. The transactions of cryptocurrency get recorded from entity which has no identification possibility based on the anonymity of the transactions in blockchain. The cryptocurrency contains the delay of transactions in the end of period. It become difcult to record the conditions and events for the financial purposes.

III.PROPOSED SYSTEM

_ Using the Hierarchical Risk Parity for the cryptocurrency portfolio based on the usage of machine learning techniques.

_ The proposed system is able to examine the professional accounting based on the associated risk of cryptocurrency and the impact which is expected from financial statement.

_ Finding the intrinsic risk which are correlated negatively in the cryptocurrency.

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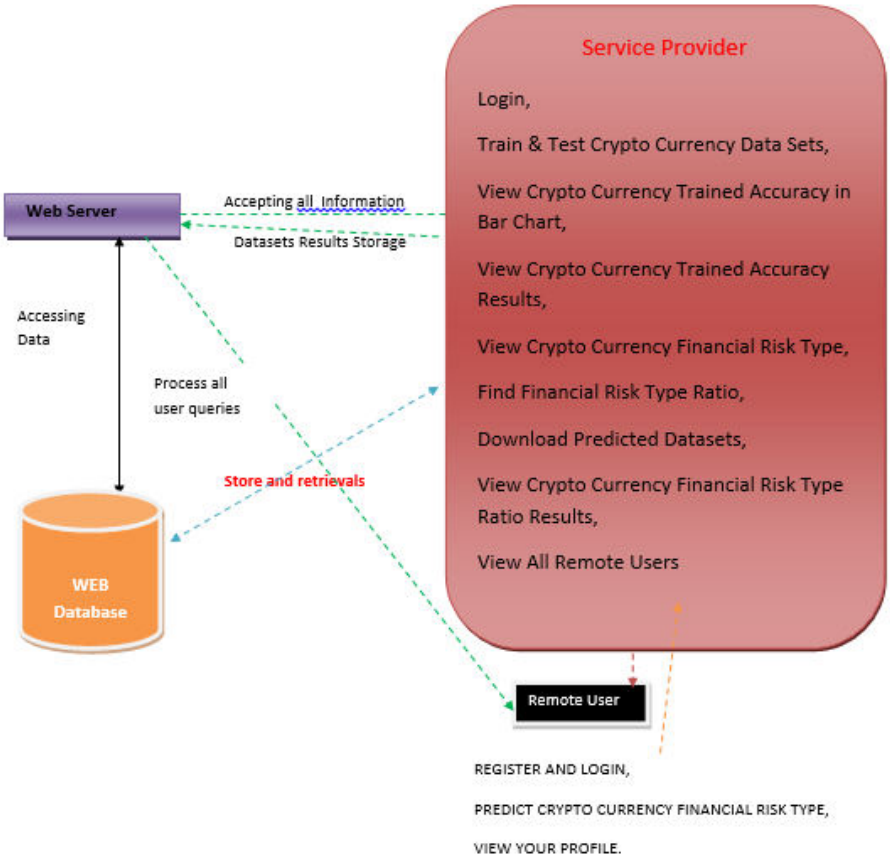
_ Ranking the exchange level control risk based on the likelihood evaluation.

_ Finding the highest likelihood risk of the determined cryptocurrency.

Advantages

1. The proposed system implements a graph-based theory and using the machine learning techniques, the proposed system is processing in the following way.

2. Clustering datasets.Recursive bisection on datasets.Quasi-diagonalization on datasets.



IV. MODULES

Service Provider

In this module, the Service Provider has to login by using valid user name and password. After login successful he can do some operations such as Login, Train & Test Crypto Currency Data Sets, View Crypto Currency Trained Accuracy in Bar Chart, View Crypto Currency Trained Accuracy Results, View Crypto Currency

Financial Risk Type, Find Financial Risk Type Ratio, Download Predicted Datasets, View Crypto Currency Financial Risk Type Ratio Results, View All Remote Users.

View and Authorize Users

In this module, the admin can view the list of users who all registered. In this, the admin can view the user's details such as, user name, email, address and admin authorizes the users.

Remote User

In this module, there are n numbers of users are present. User should register before doing any operations. Once user registers, their

details will be stored to the database. After registration successful, he has to login by using authorized user name and password. Once Login is successful user will do some operations like register and login, predict crypto currency financial risk type, view your profile.

V.CONCLUSION

In this study, the risk management of crypto currency network analysed using the Reinforcement Learning (RL) technique and asset allocation method named as Hierarchical Risk Parity (HRP) that applied in crypto currencies portfolio. Reinforcement learning gives a high performance evaluation results as compare to other machine learning techniques have been used in this area. The main reason of applying RL in this process is the learning-based aspect of this approach which gives the opportunity to system structure to get the high accuracy in term of giving the right information to system. Moreover, the HRP has the highest properties and desirable diversi_cation. The results analyzed using various estimation windows and methodologies and similarly re-balancing the selected period. The applied HRP gives the transitional asset allocations meaningful alternative and improve the risk management process. In future research, the proposed technique will extended by applying out-of-sample testing performance in more assets and classes and using techniques of optimization to get better performance in term of risk management.

VI. REFERENCES

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