Reviews of ECONJOURNAL-D-24-00053R2

Mechanism Analysis and Response of Digital Financial Inclusion to Labor Economy based on ANN and Contribution Analysis

Round 1

Reviewer 1

COMMENTS FOR AUTHORS

This is an interesting study as the authors discusses the application of artificial neural networks (ANN) in analyzing the impact of digital inclusive finance on the labor economy. The authors should take note of the following suggestions and comment to give more clarity and beauty to their work.

ABSTRACT

·The abstract mentions the use of the adaptive and self-learning ability of ANN, but it lacks specific details about the dataset used, the training methodology, and the characteristics of the digital inclusive finance indices.

·Garson algorithm should be included to the keywords.

·The abstract presents findings as 'the importance of certain indexes in digital inclusive finance to the labor economy……., it lacks specific numerical results or statistical measures to support these findings. The author should look into giving quantitative information of the results.

·The authors should provide a clear explanation of the conceptual framework. The author explores the response and transmission mechanism of digital inclusive finance to the labor economy but does not elaborate on how the concept is integrated into the study.

·The author should check for grammatical issues. E.g instead of writing 'This paper uses the concept of digital inclusive finance related tools and policies to solve the labor economy' the author can write "This paper employs tools and policies related to digital inclusive finance to address labor economy challenges."

INTRODUCTION

·The reviewed related works is too small. Authors should review more recent works, identify the gaps which will serve as rationale to the work.

RESULTS AND CONCLUSION

Under section 4.3

·The author should check for other instances where Multiple Perception is used instead of Multiple Perceptron

·There is a typo error in "activation function and a range of 10-30 hidden layer units on a single hidden layer." It should be "activation function with a range of 10-30 hidden layer units on a single hidden layer."

·Referring to the model accuracy converging to the "best state with the highest confidence level" is not standard terminology. It might be more accurate to say that the model converges to an optimal state or achieves a high level of accuracy.

·The conclusion lacks specific details on the empirical findings of the study. The authors should answer the following:

·How did you balance the dataset?

·Can you provide details on the version of IBM SPSS Statistics used for training the artificial neural network?

·How were R^2 and MAPE used as criteria to evaluate the optimal model?

·Can you provide more details into the interpretation of these metrics and how they influenced the choice of the optimal model?

·Throughout the document, there are numerous instances of grammatical and punctuation errors that detract from the overall clarity and professionalism of the work. It is highly recommended that the authors undertake a thorough review of the manuscript to correct these mistakes. Attention to detail in grammar, punctuation, and sentence structure will not only enhance the readability of your paper but also bolster its credibility and scholarly impact. Engaging a professional proofreading service or seeking assistance from a native English speaker with expertise in academic writing could prove invaluable in refining your manuscript to meet the rigorous standards of academic publishing. Improving these aspects of your manuscript will ensure that the significant contributions of your study are conveyed with the precision and excellence they deserve.

Reviewer 2
Comments to Author(s)

Article Title: This must be simplified to portray the research's beauty.
Abstract
The abstract should have started with a proper introduction and background of neural network, and its structure. The limitation of the study is not clearly stated. The abstract is meant to be organized and displayed in stages, e.g., introduction, method, result, and conclusion.

It is also advisable to use a grammar editor or an expert in grammar or language to assist in correcting grammatical and punctuation errors.

LITERATURE REVIEW: The review is done, but the presentation needs to coincide and they are somehow meddling up, it will be better if the literature review is summarized to enable the paper look admirable, the review need more recent citation as the most common research in this area in 2022 which will make the integrity of the research somehow questionable. Also, there should be a level of clarity as it needs to flow alongside the state of the heart problem required to be solved.

METHODOLOGY:
- The method used in the data characteristic is not correctly stated, and if the data are obtained only, they are not adequately discussed.
- There is no flowchart, or any diagram representing the proposed model or even the previous model is not represented in this paper and if it is not represented there is no way to quickly understand area of contribution to this research.
- Garson's Algorithm was use to a method used in carrying out this research but there is no clarity on the status of the research and also the method of the research before using the said algorithm.
- Data collection and preprocessing is meant to be discussed before carrying out the actual analysis.
- There is no diagram representation for the proposed Analysis or Architecture.
- The methodology is not coinciding it needs to be well presented and simplify such that the state of the heart research can easily be determined. It is also advisable to present every necessary diagram, flowchart or algorithm in every stage so that we it will be easier to identify the contribution to the body of knowledge.

CONCLUSSION:
This is promising research that researchers should look forward to in future. Meanwhile, there is some information that is not adequately presented in this paper, as shown below:
- Contribution to the body of knowledge is not clearly stated, as the abstract needs to be looked into showing the information of some key words as stated previously.
- There are too many references in this research which is indirectly showing deficiencies in the area of displaying the main research purpose and also recent reference is necessary.
- There is should a tabulation or relationship between in previous research and current research in the concluding part of the literature review.
- Data representation: No table, no flowchart for proposed research, no algorithms for proposed, e.t.c how can we be sure the contribution to the body of knowledge is addressed in this research.
- Methodology, result, and performance evaluation should be well arranged and stated as they are the most critical areas showing the research's originality. Also, system design is supposed to be integrated into the methodology. The research in general need to be arranged and properly presented for better understanding and future research.

Reviewer 3

This manuscript aims to analyze the mechanism and response of digital financial inclusion on labor economy using artificial neural network (ANN) and

contribution analysis approach. The topic about how digital finance impacts labor market is significance and timely. However, there are some major issues in the current version that require addressing before considering it for publication:

I. The theoretical framework for analyzing the relationship between digital finance and labor economy is not comprehensive. More recent studies in this area need to be cited and integrated into the framework.
II. The literature introduced is limited and does not sufficiently cover the key variables and relationships examined in the empirical analysis. A more thorough literature review is needed. Update references such as: 10.32602/jafas.2019.38, 10.1007/s13132-023-01558-5, 10.22105/jarie.2023.370729.1514, 10.1016/j.eswa.2023.121769, 10.22105/riej.2023.361216.1336, 10.32602/jafas.2023.023, 10.31181/dmame7120241041, 10.22105/jfea.2023.379363.1241, 10.56578/josa010402, 10.22105/bdcv.2022.326976.1046, 10.32602/jafas.2019.35, 10.56578/jcgirm100104
III. The justification for using ANN approach over other methods is lacking. The advantages and limitations of the method also need discussion.
IV. More details on the data and variables used in the empirical analysis are needed for replication purposes. Issues around data sources, measurements and potential biases should be discussed.
V. The model specifications, estimation process, and results from both ANN and contribution analysis are not clearly presented. The key findings are not sufficiently discussed or interpreted.
VI. Robustness checks of the results (e.g. using different data sets, variables definitions or model specifications) are missing but important.
VII. The empirical results do not seem to provide sufficient evidence to draw policy implications on how to promote labor economy through digital finance. More nuanced discussion is needed

Reviewer 4
This paper uses the adaptive and self-learning nature of artificial neural networks (ANNs) to investigate labor market economics and extends hierarchical index weight analysis to examine the response and transmission mechanisms of the concept of digital financial inclusion in labor market economics. Specific considerations include.

The current conclusion section contains a lot of repetitive information and overly detailed narratives, which may dilute the efficiency of information conveyance. Consider removing redundant content, distilling key findings, and emphasizing the innovative aspects and practical value of your research to make the conclusion more concise and powerful.

In this paper, we innovatively use the analysis materials of the Peking University Digital Inclusive Finance Index released by the Peking University Digital Finance Research Center to study the response and transmission mechanism of the concept of digital inclusive finance on the labor economy and to discover the impact of its "inclusive" principle on the labor economy in such aspects as labor productivity enhancement and labor mismatch. At the same time, compared with most of the internationally constructed traditional inclusive finance indices, the concept of digital inclusive finance is also innovative in terms of combining digital technology and finance, which can improve information asymmetry, and alleviate the problem of reduced free mobility of factors caused by the purpose of protecting local industries.

In terms of research methodology, this paper makes use of the characteristics of ANN's adaptive and self-learning capabilities to complete the hierarchical analysis of the indicator weighting problem. The Garson algorithm is also used for sensitivity analysis to maximize the neural network structure that truly responds to the real situation of the indicator data and adaptively adjusts the link weights between neurons. Compared with the more common linear regression methods, the artificial neural network can more accurately fit the complex relationships between multiple independent variables and multiple dependent variables and deal with the possible nonlinearity, nonconvexity, and non-limitations that may appear in the correlation problem, Moreover, the positive-terminated importance derived from the artificial neural network training test is closer to the real situation compared with the traditional weight analysis, that is, it has a stronger ability to fit the reality. By discussing the results, different components of the digital inclusive finance index have different significant correlations to various secondary indicators of the labor economy. The Garson algorithm is also used for sensitivity analysis to maximize the neural network structure that truly responds to the real situation of the indicator data and adaptively adjusts the link weights between neurons. Digital inclusive finance complements various factors in the labor economy such as labor supply and demand allocation, macro and micro management of labor, labor efficiency, and labor reproduction, which alleviates the level of financing constraints in the financial market and can improve labor productivity and thus promote the development of the labor economy.

As a microscopic study of the transmission and response mechanism of digital inclusive finance to the labor economy, the empirical marginal effects of the research results are examined under the perspective of a contribution analysis, which has practical guidance in policy formulation, economic prospect development, and sinking market extension. At the same time, as the application of artificial neural network research methods in empirical economics, it has a certain degree of inspirational exploration significance for economic and financial empirical tests. Further, as a mechanism analysis and corresponding research of the digital inclusive finance concept and traditional

labor economy, it promotes the advantages of the digital inclusive finance concept relative to the international traditional inclusive finance concept in terms of digital technology.

The study aims to explore what and how aspects of digital inclusive finance are transmitted to cause changes in the labor economy and to provide a quantitative study of the changes. After measuring the importance of the variables of digital inclusive finance on the labor economy under the sub-indicators, linear regression analysis can be considered to measure the impact coefficients on this basis for further truth testing and expansion. The target geographic scope of this study is the Northeast China region, which shows strong sensitivity to labor economy indicators. The scope of the study can be further extended in the future.

Round 2
Reviewer 1
Based on the revised document and the thorough point-by-point response provided by the authors addressing the reviewers' comments, it is evident that significant efforts have been made to enhance the manuscript's quality. The authors have diligently incorporated the recommended revisions, demonstrating a commitment to addressing the concerns raised during the review process. As a result, the manuscript has been substantially improved, aligning more closely with the standards expected for publication in our reputable journal. Therefore, I highly recommend accepting this revised manuscript for publication.

Reviewer 2
This manuscript has been substantially revised based on the comments provided in the first round of review. The authors have done a commendable job addressing most of the key issues raised previously. A few remaining minor points require attention:

1- A few more recent references (published in 2023 and early 2024) could still be added to ensure coverage of the most up-to-date research in this area.
2-The description of data processing could be further streamlined for improved readability. Consider using sub-sections or numbering to organize details on data sources, missing data imputation, variable standardization etc.
3-The key findings of the ANN and sensitivity analyses are discussed clearly in text. Consider including an additional table or figure to succinctly summarize e.g. ranking of variable importance as per Garson algorithm outputs.
4-Consider discussing some new research avenues that have emerged based on the study findings e.g. examining impacts on specific demographic groups, impacts over longer time periods, cross-country comparisons etc. This will further strengthen the manuscript

Reviewer 3

All my previous comments have been incorporated in the revised version

Round 3

Reviewer 1

Based on the revised version and the authors' thorough, point-by-point response to the reviewers' criticisms, it is evident that a great deal of effort has gone into improving the manuscript's quality. By carefully putting the suggested improvements into practice, the authors have demonstrated that they are committed to finding solutions to the problems raised during the review process. The work has significantly improved as a result, approaching the levels needed for publication in our prestigious journal. Therefore, I highly recommend that this revised work be published.

Reviewer 2

Congratulations to authors for the acceptance of your article. I'm confident that your article will inspire many others in the academic community.

Reviewer 3

All my previous comments have been incorporated in the revised one