

## Peer Review

# Review of: "Hybrid Quantum Neural Networks with Amplitude Encoding: Advancing Recovery Rate Predictions"

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The paper "Hybrid Quantum Neural Networks with Amplitude Encoding: Advancing Recovery Rate Predictions" is an interesting application of hybrid QNN algorithms in the financial sector. Even though the slightly higher accuracy does not ultimately provide conclusive evidence of a genuine quantum advantage, the work demonstrates that hybrid quantum algorithms are at least on par with classical ML algorithms.

Specifically, the following observations can be made about the paper:

- The reviewed literature does not fully reflect the extent of previous work in this field and should therefore be expanded. For instance, on page 3, Schetakakis et al. (2024) is cited as a source for a hybrid QNN. A similar approach was published earlier, see e.g., <https://doi.org/10.1049/qtc2.12017> and the additional works cited there.
- On page 7, it is stated that due to the many dependent features, "traditional statistical regression models would be ineffective." This assertion is too broad, as it is expected that with the present dataset, polynomial regression with Lasso/Ridge regularization or a Random Forest model would offer a comparable predictive performance to that of the neural network. It is therefore recommended to expand the investigated classical ML models in this direction.
- Figure 4 on page 7 shows a clear temporal trend in the data. It should be examined and discussed whether, in light of this fact, an explicit (quantum) time series model should be considered. This is particularly pertinent since the cross-validation method described on page 14 uses data from later time points to predict earlier ones.

## **Declarations**

**Potential competing interests:** No potential competing interests to declare.