**Appendix B: Experimental Results and Data Analysis**

This appendix presents comprehensive experimental results and analyses to validate the effectiveness of the proposed RepuTrade mechanism compared with a traditional method (Wang’s baseline). The experimental evaluation comprised two distinct sets of simulation scenarios, each consisting of five rounds of testing. Specifically, rounds 1 to 5 represent experiments using the traditional method, characterized by a fixed deposit mechanism and standard reputation management, while rounds 6 to 10 correspond to the proposed RepuTrade mechanism, incorporating dynamic reputation evaluation and adaptive deposit adjustments. All experiments consistently measured key performance indicators, including consensus latency, transaction success rate, default frequency, and the evolution of participant reputations. Detailed experimental data, presented in structured CSV files, along with visualization charts (PNG format) demonstrating clear performance differences between the two methods, have been systematically collected and organized. These data files and visual analyses are provided in the supplementary ZIP file named "Appendix B Experimental Results and Data Analysis.zip", enabling thorough examination and verification of experimental findings. The results clearly demonstrate that the RepuTrade method significantly enhances system reliability and operational efficiency, reducing transaction defaults and ensuring stable reputation management across all testing scenarios, thereby effectively achieving the intended research objectives outlined in this paper.