Paper title: **Randomness Modeling in Supply Chain Simulation**

1 Summary

1.1 Motivation/purpose/aims/hypothesis

The paper aims to address the challenges of modeling randomness in supply chain simulation. It focuses on the incompatibility between specific characteristics of theoretical distributions and the assumptions of simulation and mathematical calculus in supply chains. The hypothesis is that the choice of input modeling method significantly impacts the accuracy and reliability of simulation output in supply chain modeling.

1.2 Contribution

The paper contributes by analyzing the practical problem of selecting an appropriate input modeling method for analyzing the efficiency of replenishment policies in supply chains. It provides insights into the challenges of using theoretical probability distributions in supply chain simulation and offers alternative solutions to deal with normally distributed demand with a high coefficient of demand variation.

1.3 Methodology

The methodology involves analyzing input data in the context of supply chain simulation, exploring different input modeling methods, and investigating alternative solutions to deal with normally distributed demand. The paper presents a detailed analysis of the iterative transformation of normally distributed demand, the introduction of truncated normal distribution, and the use of an alternative distribution, specifically the log-normal distribution.

1.4 Conclusion

The paper concludes that the choice of input modeling method is crucial for accurately representing randomness in supply chain simulation. It highlights the limitations of certain input modeling methods and proposes the use of the log-normal distribution as an alternative to the normal distribution for modeling demand in supply chains with high coefficient of demand variation.

2 Limitations

2.1 First Limitation/Critique

One limitation of the paper is the complexity and potential time-consuming nature of the proposed iterative transformation of normally distributed demand. While this method addresses the issue of negative demand, it may require significant computational resources and expertise to implement effectively.

2.2 Second Limitation/Critique

Another limitation is the reliance on the log-normal distribution as an alternative to the normal distribution. While the log-normal distribution resolves the issue of negative demand, it may introduce additional complexity in modeling and analysis, especially for practitioners unfamiliar with this distribution.

3 Synthesis

The ideas presented in the paper have implications for the practical application of supply chain simulation and future research in this area. The alternative solutions proposed for modeling randomness in supply chains can be applied to real-world supply chain management scenarios, improving the accuracy of simulation models and decision-making processes. Additionally, the paper opens up avenues for further research into the development of more efficient and accurate input modeling methods for supply chain simulation.