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Time Series Analysis: U.S. Military Casualties in World War Two

Rachael Becker

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Rachael Becker

University of Central Florida

Abstract

Using statistical analysis of casualties data from the pacific theater to prove that Harry Truman's justification for dropping the atomic bomb was plausible.

Background

Harry Truman's main reason for dropping the atomic bomb was to bring the war to an end quickly in an effort to obviate the need for an invasion of the Japanese home islands and avoid the extreme U.S. losses that were predicted. Although probably not one of his main concerns, Japanese citizens were dying at a rapid rate. This was a result of the propaganda that had been spread by the Japanese military about the U.S. soldiers. This caused an extremely high rate of suicide among the Japanese citizen because they feared what would happen when the U.S. soldiers invaded the island they were residing on.

Hiroshima and Nagasaki

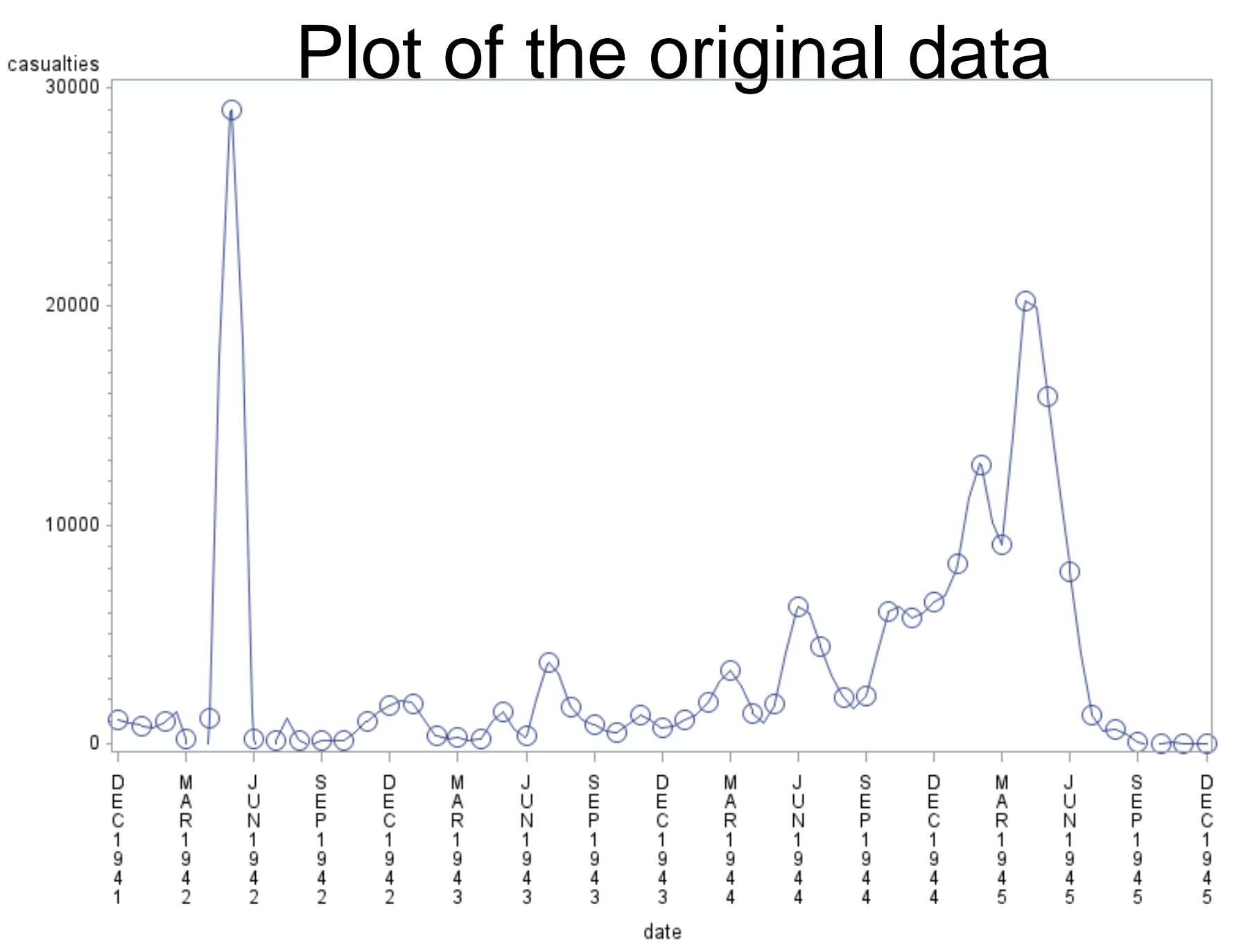


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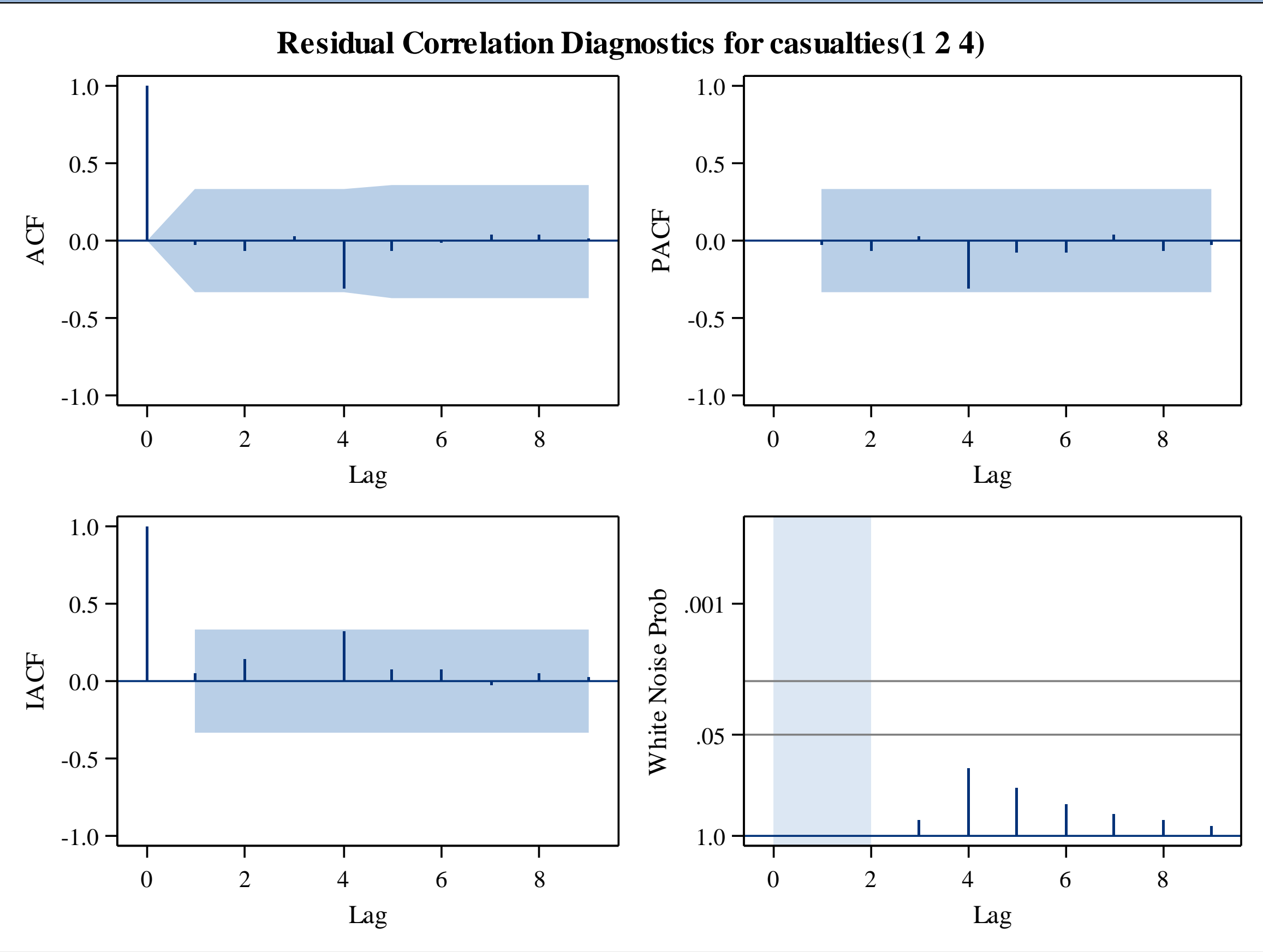
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Method



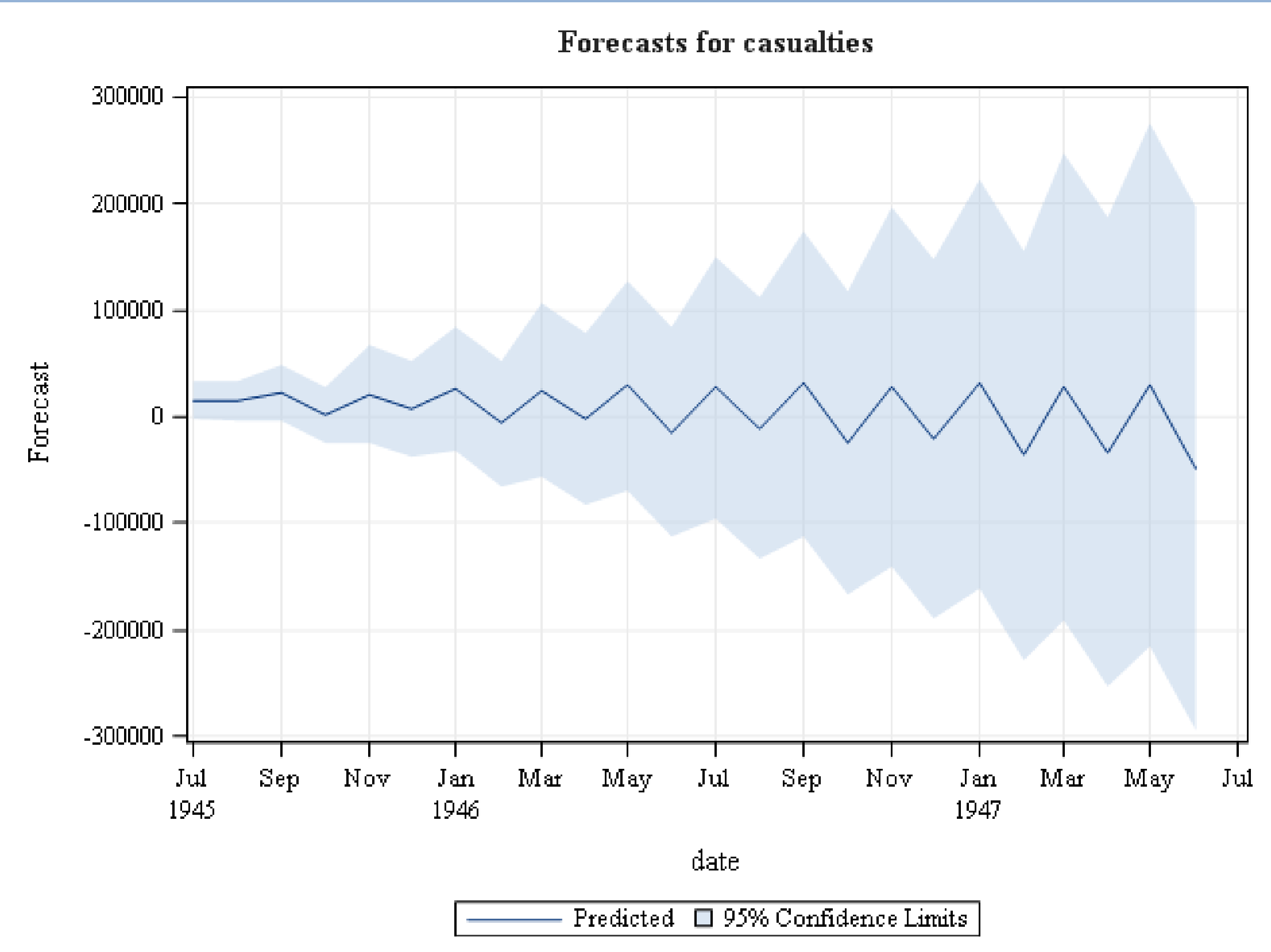
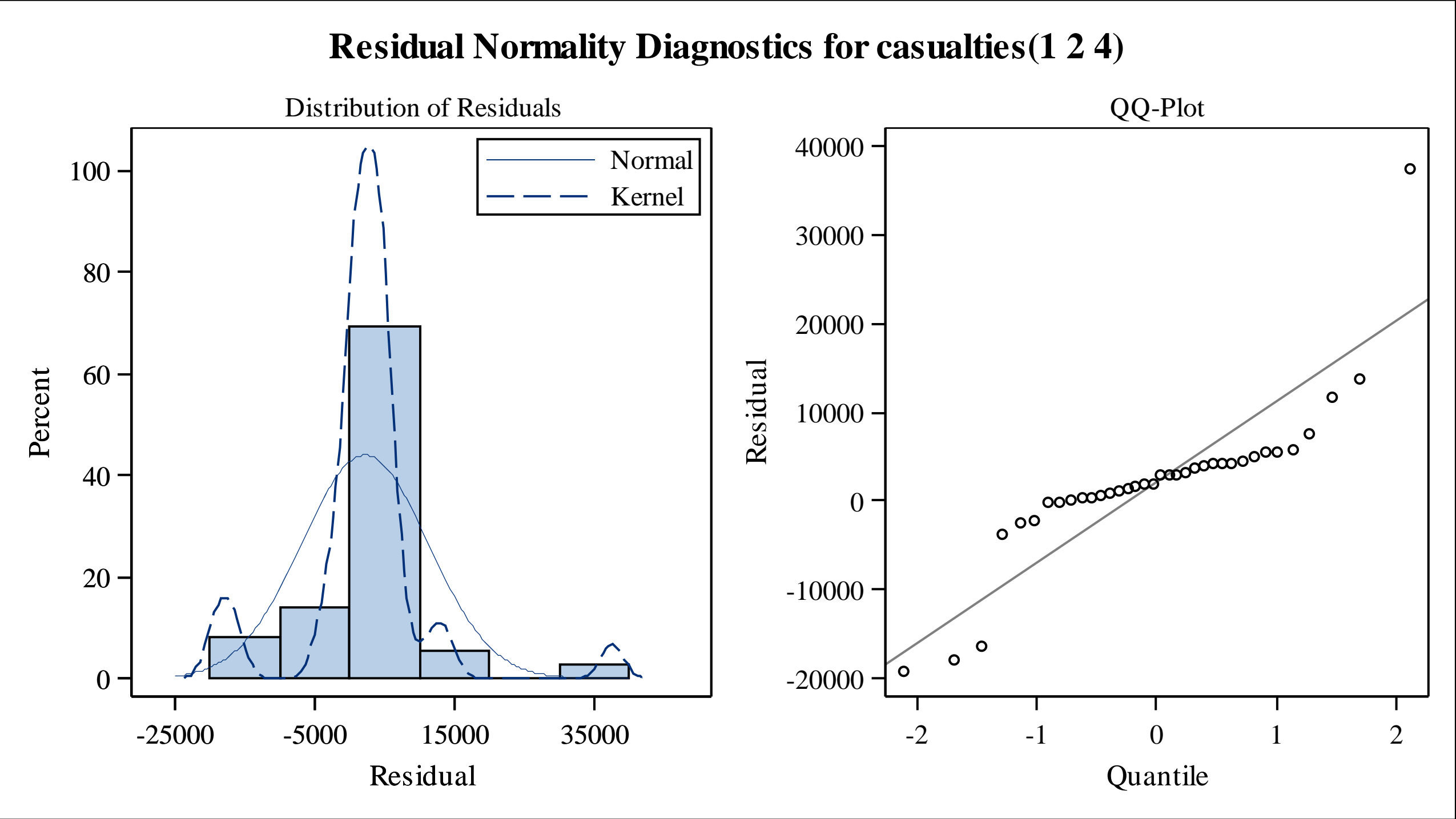
- Clearly there is something occurring in May of 1942
- Proceeded with an adjusted data set that truncated the last few months because they were after the decision had been made that there would be a change in strategy (i.e. the use of atomic weapons)

- None of our lags look too outrageous, but we still need to check normality.



Method (continued)

- As demonstrated by the adjacent plots, normality is violated which suggests that this model is not the best for predicting future values.



- The forecasted data goes negative which is undesirable because it does not make sense in the context of the data.

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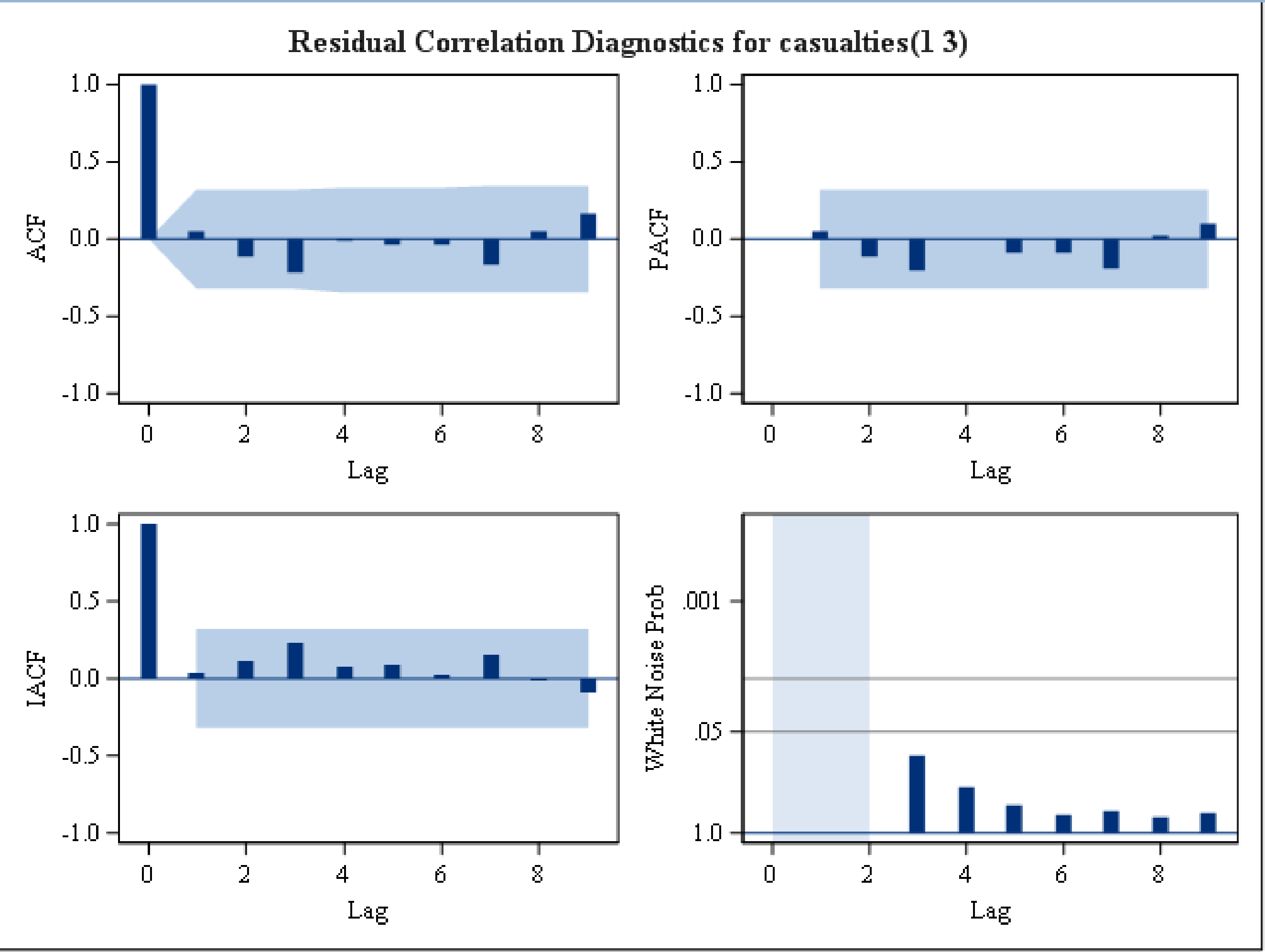
Methods (continued)

Removed the data from the battle of the midway by taking the average of the data points above and below the May 1942 observation.

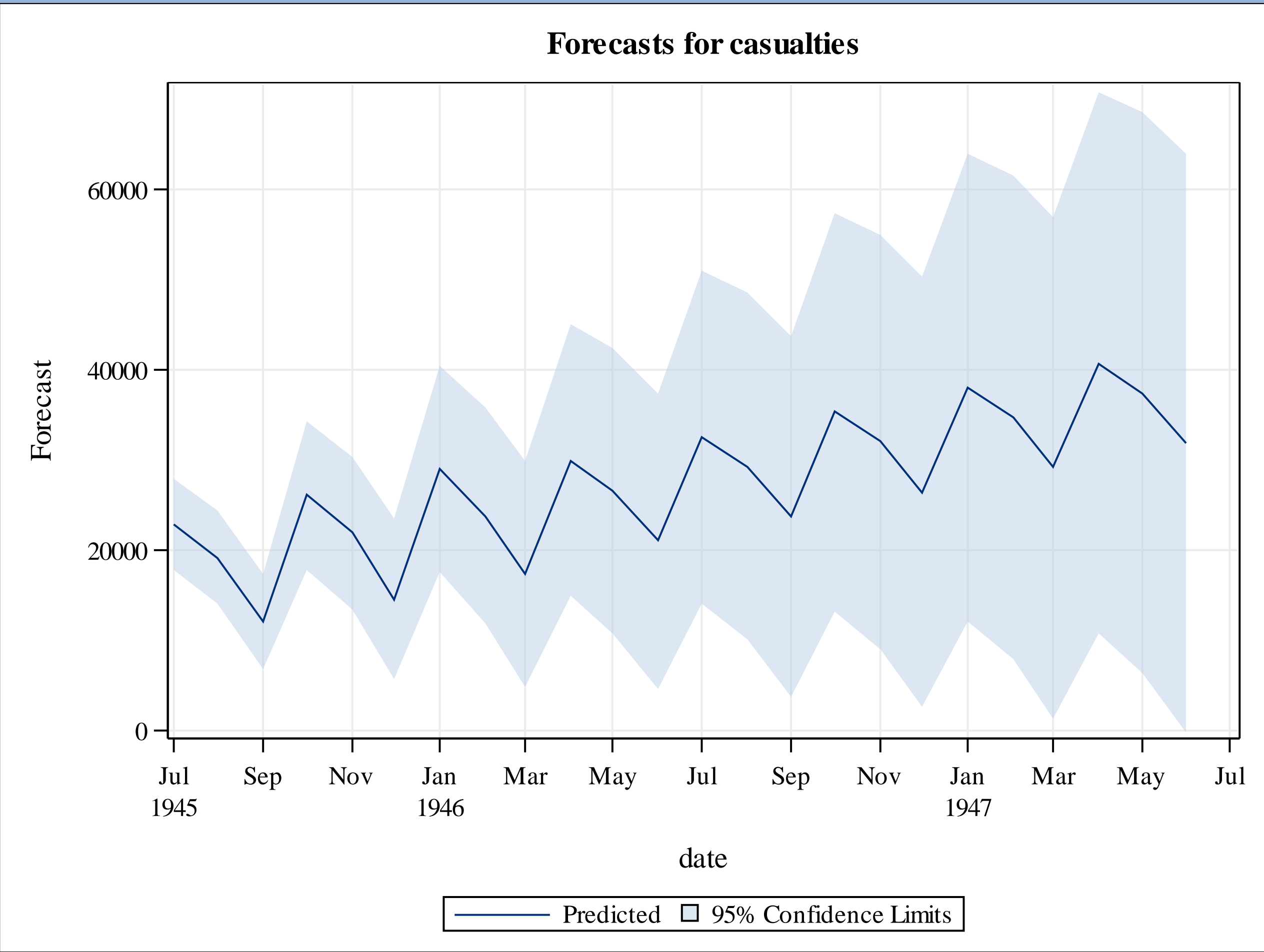
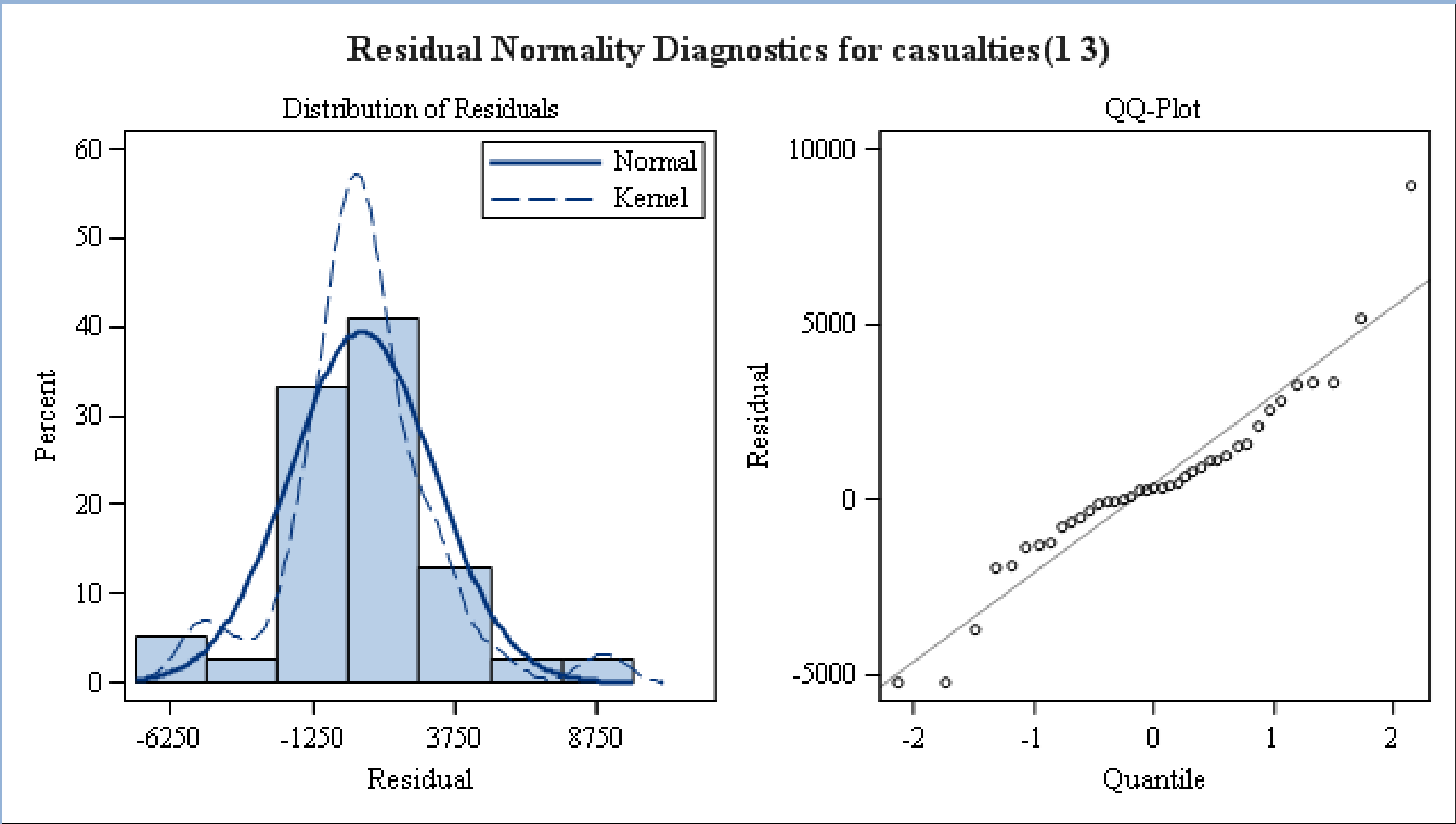
The periods of differencing were adjusted to reflect the change in the data.

The QQ plot looks approximately linear.

The forecasting graph remains positive.



Methods (continued)



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Conclusion

Looking at the most extreme estimates of American Military casualties, it is clear that Harry Truman's justification was valid even without considering the Japanese Military and Civilian losses that would have occurred had an invasion of the home island been necessary.

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Acknowledgments

I would like to thank Dr. Barbara Gannon, professor of History at the University of Central Florida, for suggesting this topic of research. I would also like to thank Dr. Liqiang Ni, professor of Statistics at UCF, for his guidance in exploring time series data. I would like to thank Kelcey Ellis, professor of Statistics at UCF, for her continued support and encouragement. Lastly, I would like to thank Dr. Richards Plavnieks, professor of History at UCF, for his contributions to this paper and his efforts to review it.

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