policy according to this assumption. We calculated $E[\boldsymbol{C_T}]$ as \$49169.29 except 11th row which $E[\boldsymbol{C_T}]$ is \$49488.29 since there are lost sales in the system. So, there is \$319 lost sale cost. We did not take service level constraint into account in Heuristic I.

In Heuristic II, we assumed that $E[d_j](1 + \mathrm{ZCV})$ is the realized demand for assuring service level α. We calculated $E[\boldsymbol{C_T}]$ as \$58605.21. There are no lost sales in the system for this case.

Table.3 Results for Heuristic II

No	**1**	**2**	**3**	**4**	**5**
Dev.%	38.48	54.18	28.12	205.05	33.22
No	**6**	**7**	**8**	**9**	**10**
Dev.%	76.96	175.87	8.05	56.25	39.51
No	**11**	**12**	**13**	**14**	**15**
Dev.%	16.54	59.89	316.82	23.84	184.64

4. Conclusions and future works

The stochastic models due to one warehouse N retailers problem have the best performances in terms of percentage deviation from the lower bound (1.59% for Heuristic I, 8.05% for Heuristic II) while the stochastic model has the worst performance with 249.71% deviation for Heuristic I and 316.82% deviation for Heuristic II.

The stochastic model cost performance rises while the differences between the realised demands and the expected demand get smaller as stochastic model cost get closer to the deterministic model (lower bound) cost.

Our aim is to get a solution to uncertain demand. We realized it. Different retailers numbers, CV and α value can be investigated. The system can be modelled by simulation software (ARENA, PROMODEL, etc.).

For future work, new heuristics for one warehouse N retailers problem under uncertain demand could be developed. Lead-time and price uncertainty can be incorporated into problem formulation. Defect rates can be taken into account. Fuzzy modelling can be adapted to the problem.

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