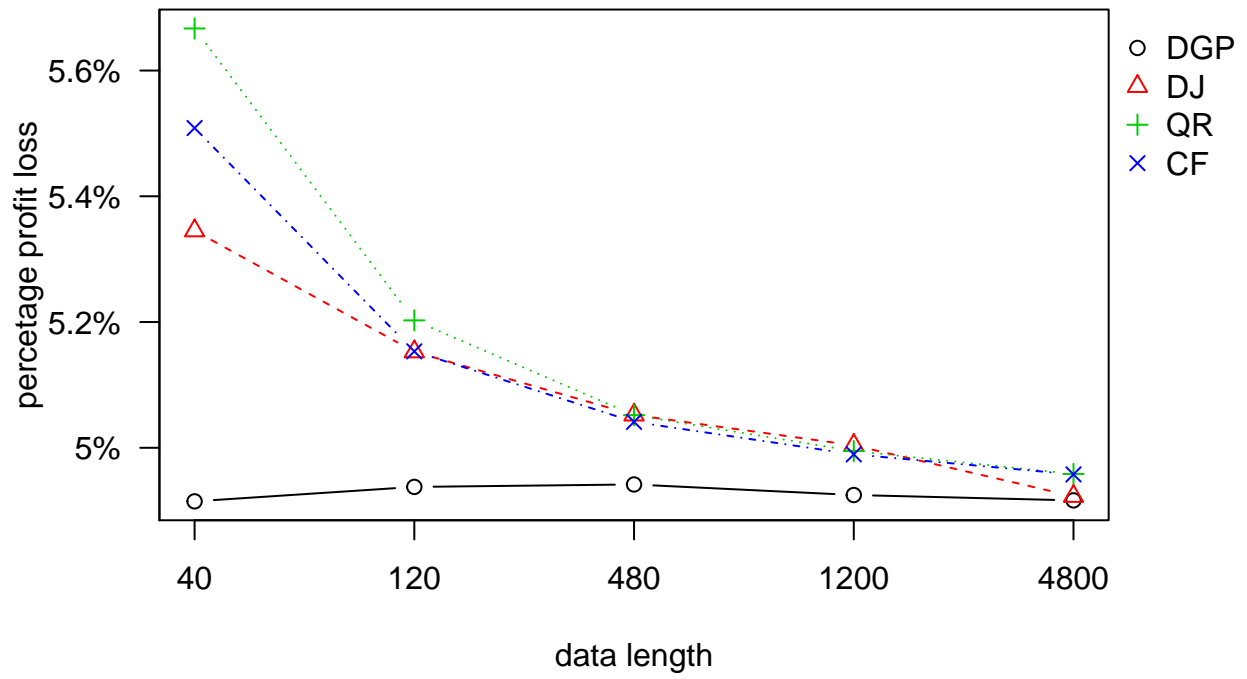


linear norm plot

Joshua

15/05/2020



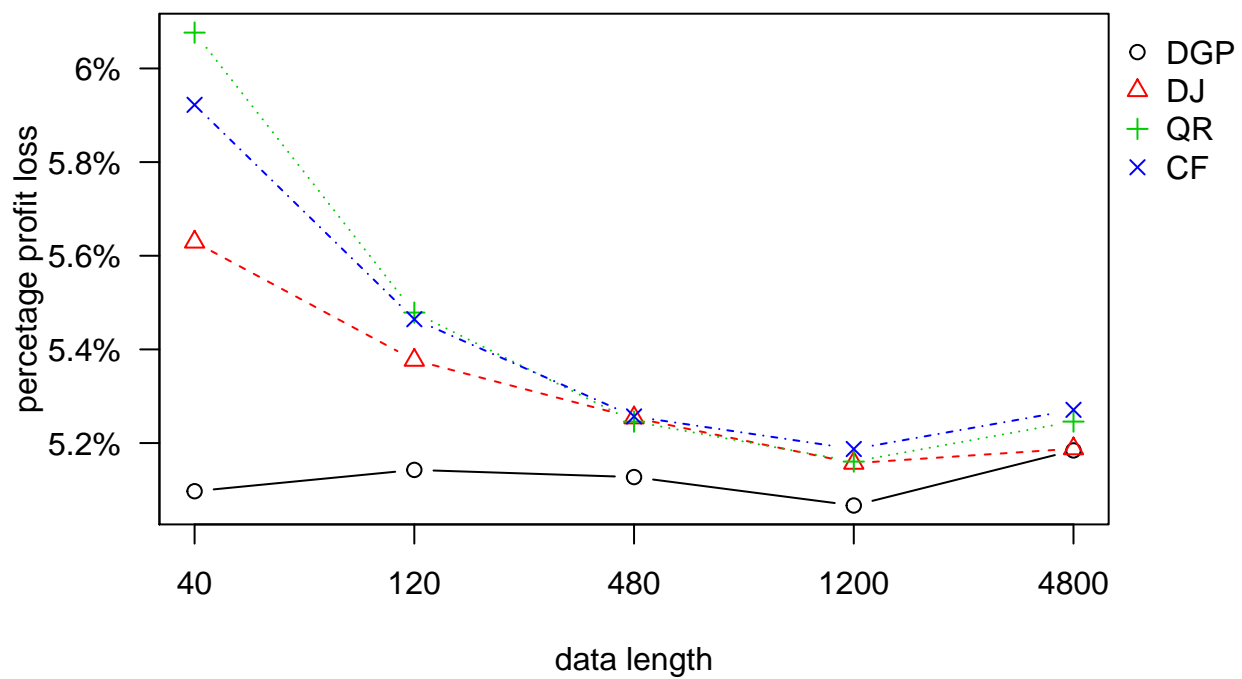
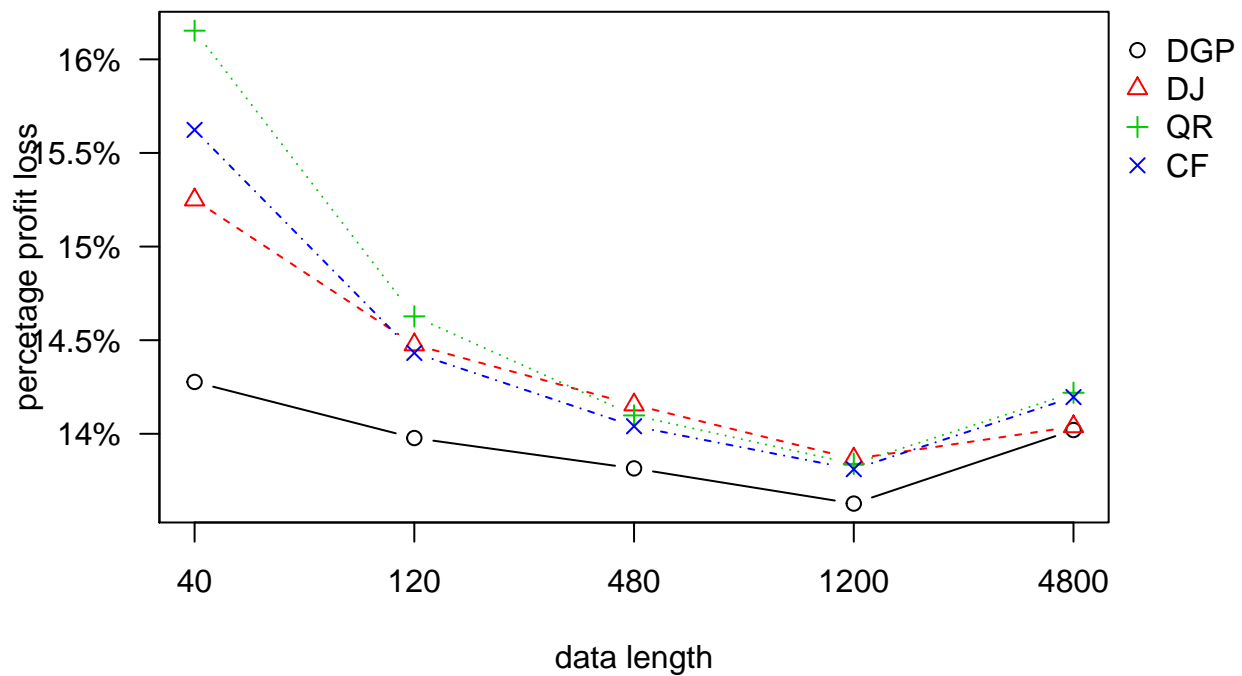


Table 1: Inventory Error

| Data size | Target service level=0.5 | | | | Target service level=0.63 | | | | Target service level=0.3 | | | |
|-----------|--------------------------|----------|----------|----------|---------------------------|----------|----------|----------|--------------------------|----------|----------|----------|
| | DGP | disjoint | quantile | proposed | DGP | disjoint | quantile | proposed | DGP | disjoint | quantile | proposed |
| 40 | 0.7 | 32.98 | -0.48 | -0.16 | -89.49 | -47.68 | -60.64 | -62.2 | 135.99 | 151.12 | 106.49 | 96.5 |
| | (200.12) | (220.85) | (232.6) | (225.62) | (200.93) | (222.85) | (234.95) | (227.4) | (199.9) | (222.22) | (236.44) | (227.4) |
| 120 | 2.01 | 14.07 | 1.96 | 1.96 | -74 | -60.69 | -69.19 | -65.85 | 114.32 | 125.76 | 106.21 | 101.36 |
| | (200.57) | (211.5) | (211.92) | (209.86) | (200.59) | (211.19) | (211.79) | (209.24) | (200.74) | (211.37) | (212.14) | (210.26) |
| 480 | 1.16 | 4.12 | 0.88 | 0.97 | -70.42 | -67.98 | -70.15 | -68.47 | 107.98 | 111.99 | 107.12 | 104.83 |
| | (201.43) | (206.98) | (205.86) | (205.4) | (198.37) | (204.57) | (202.44) | (202.05) | (199.73) | (205.23) | (203.95) | (203.64) |
| 1200 | -0.51 | 1.17 | -0.35 | -0.34 | -66.07 | -66.12 | -66.47 | -65.29 | 105.68 | 109.2 | 106.36 | 104.39 |
| | (200.63) | (204.61) | (203.62) | (203.35) | (197.66) | (201.9) | (200.7) | (200.68) | (197.75) | (202.4) | (201.04) | (201.18) |
| 4800 | 2.88 | 3.45 | 3.19 | 3.12 | -67.63 | -67.33 | -68.16 | -66.98 | 106.33 | 107.18 | 106.99 | 105.37 |
| | (201.31) | (201.67) | (203.23) | (203.19) | (201.55) | (201.96) | (204.19) | (204.21) | (200.96) | (201.37) | (203.04) | (203.37) |

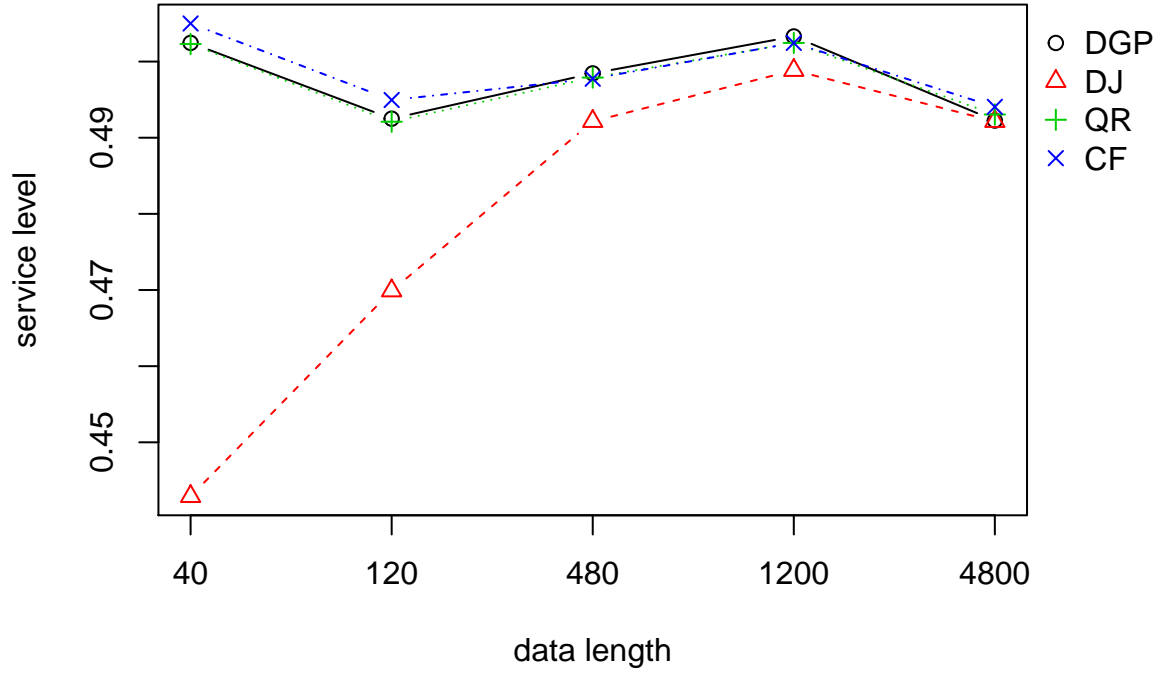
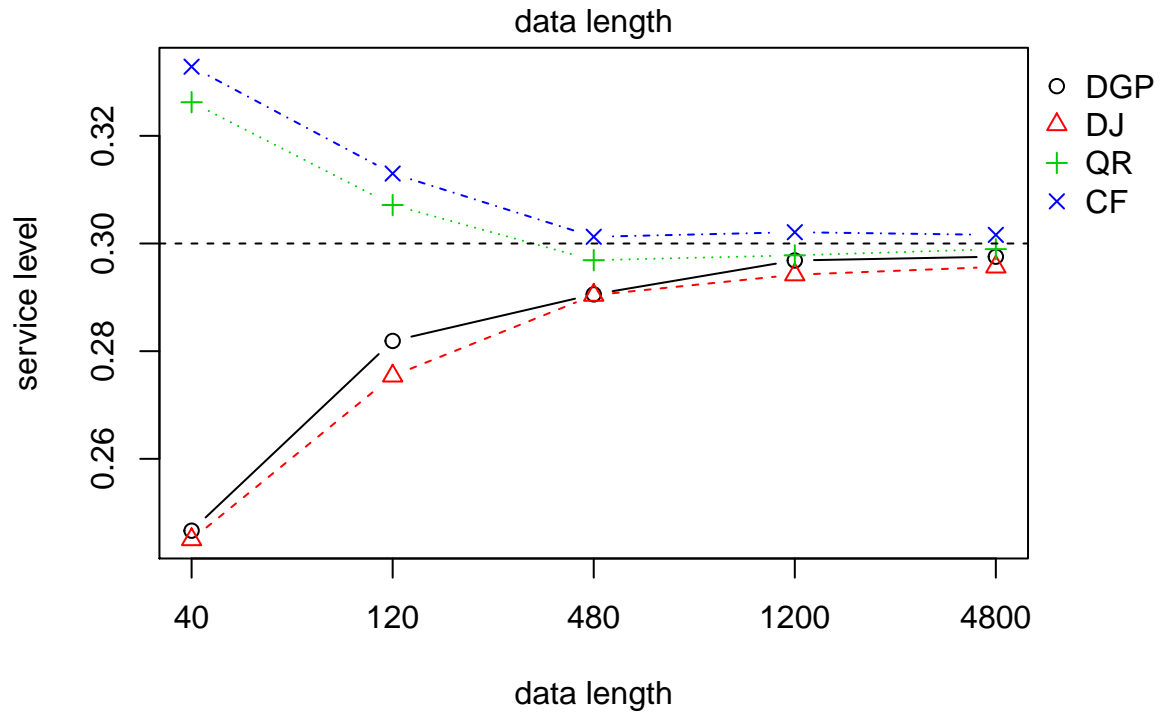
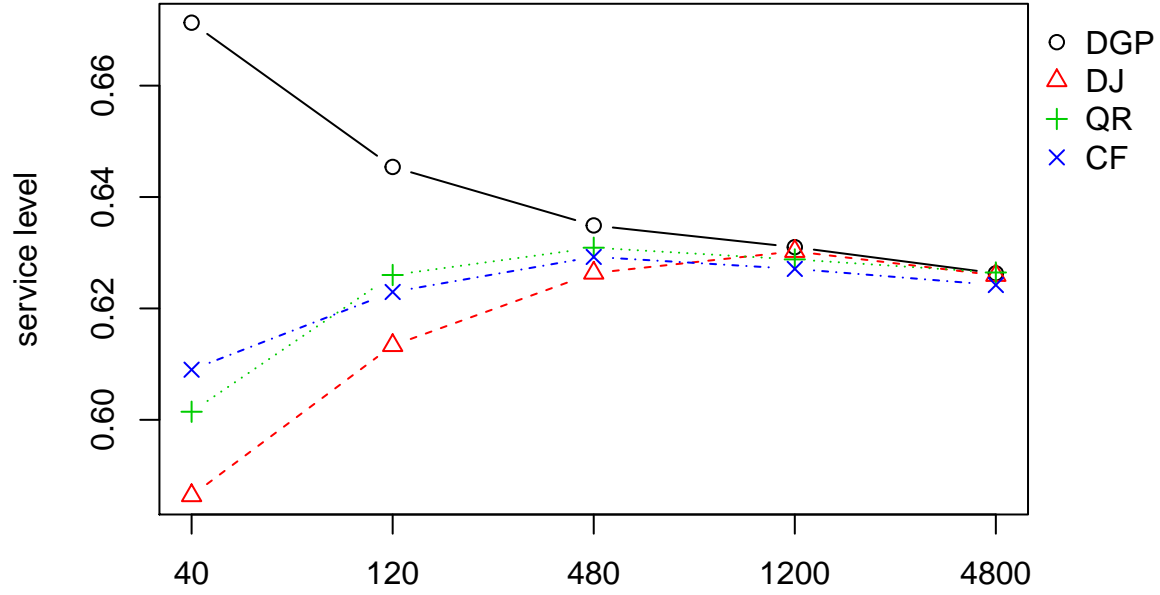


Table 2: p-value of Wilcoxon Test between data size 1200 and 4800

| Target service level | DGP | disjoint | quantile | proposed |
|----------------------|-----------|-----------|-----------|-----------|
| 0.5 | 0.0271056 | 0.1802333 | 0.0601088 | 0.0929595 |
| 0.63 | 0.3306834 | 0.3736361 | 0.6268995 | 0.5490250 |
| 0.3 | 0.8782706 | 0.7505065 | 0.8015530 | 0.9132690 |



```
##          DGP          DJ          QR          CF
## 40      0.9515126 0.9332624 0.9427216 0.9444745
```

Table 3: Target service level effect (n=40)

| Target service level | Percentage profit loss | | | | Average service level | | | |
|----------------------|------------------------|----------|----------|----------|-----------------------|----------|----------|----------|
| | DGP | disjoint | quantile | proposed | DGP | disjoint | quantile | proposed |
| 0.5 | 4.91% | 5.35% | 5.67% | 5.51% | 0.502 | 0.443 | 0.502 | 0.505 |
| 0.63 | 14.28% | 15.25% | 16.15% | 15.62% | 0.671 | 0.586 | 0.601 | 0.609 |
| 0.3 | 5.10% | 5.63% | 6.08% | 5.92% | 0.247 | 0.245 | 0.326 | 0.333 |

Table 4: Target service level effect (n=480)

| Target service level | Percentage profit loss | | | | Average service level | | | |
|----------------------|------------------------|----------|----------|----------|-----------------------|----------|----------|----------|
| | DGP | disjoint | quantile | proposed | DGP | disjoint | quantile | proposed |
| 0.5 | 4.94% | 5.05% | 5.05% | 5.04% | 0.498 | 0.492 | 0.498 | 0.498 |
| 0.63 | 13.82% | 14.15% | 14.10% | 14.04% | 0.635 | 0.626 | 0.631 | 0.629 |
| 0.3 | 5.13% | 5.25% | 5.25% | 5.26% | 0.291 | 0.290 | 0.297 | 0.301 |

```
## 120 0.9510048 0.9432327 0.9480915 0.9486686
## 480 0.9512050 0.9482805 0.9502174 0.9503142
## 1200 0.9520155 0.9501517 0.9513423 0.9513992
## 4800 0.9507583 0.9503720 0.9503585 0.9503930

##          DGP          DJ          QR          CF
## 40 0.9746412 0.9586198 0.9594740 0.9617508
## 120 0.9716568 0.9654879 0.9679448 0.9675858
## 480 0.9712849 0.9689282 0.9702442 0.9698065
## 1200 0.9705059 0.9693490 0.9699419 0.9695206
## 4800 0.9699385 0.9697061 0.9694787 0.9690286

##          DGP          DJ          QR          CF
## 40 0.8953463 0.8804924 0.9003852 0.9075537
## 120 0.9061819 0.8968225 0.9071205 0.9103971
## 480 0.9091751 0.9051790 0.9086960 0.9104068
## 1200 0.9105881 0.9074906 0.9096523 0.9110585
## 4800 0.9096004 0.9090085 0.9089646 0.9101982
```

```
\begin{table}
```

```
\caption{Size effect (q=30\%)}
```

| Data size | Percentage profit loss | | | | Average service level | | | | Fill rate | | | |
|-----------|------------------------|----------|----------|----------|-----------------------|----------|----------|----------|-----------|----------|----------|----------|
| | DGP | disjoint | quantile | proposed | DGP | disjoint | quantile | proposed | DGP | disjoint | quantile | proposed |
| 40 | 5.1% | 5.6% | 6.1% | 5.9% | 0.25 | 0.24 | 0.33 | 0.33 | 89.5% | 88.0% | 90.0% | 90.8% |
| 120 | 5.1% | 5.4% | 5.5% | 5.5% | 0.28 | 0.28 | 0.31 | 0.31 | 90.6% | 89.7% | 90.7% | 91.0% |
| 480 | 5.1% | 5.3% | 5.2% | 5.3% | 0.29 | 0.29 | 0.30 | 0.30 | 90.9% | 90.5% | 90.9% | 91.0% |
| 1200 | 5.1% | 5.2% | 5.2% | 5.2% | 0.30 | 0.29 | 0.30 | 0.30 | 91.1% | 90.7% | 91.0% | 91.1% |
| 4800 | 5.2% | 5.2% | 5.2% | 5.3% | 0.30 | 0.30 | 0.30 | 0.30 | 91.0% | 90.9% | 90.9% | 91.0% |

```
\end{table}
```

Table 5: Target service level effect (n=4800)

| Target service level | Percentage profit loss | | | | Average service level | | | |
|----------------------|------------------------|----------|----------|----------|-----------------------|----------|----------|----------|
| | DGP | disjoint | quantile | proposed | DGP | disjoint | quantile | proposed |
| 0.5 | 4.92% | 4.92% | 4.96% | 4.96% | 0.492 | 0.492 | 0.493 | 0.494 |
| 0.63 | 14.02% | 14.04% | 14.22% | 14.20% | 0.626 | 0.626 | 0.626 | 0.624 |
| 0.3 | 5.18% | 5.19% | 5.25% | 5.27% | 0.298 | 0.296 | 0.299 | 0.302 |