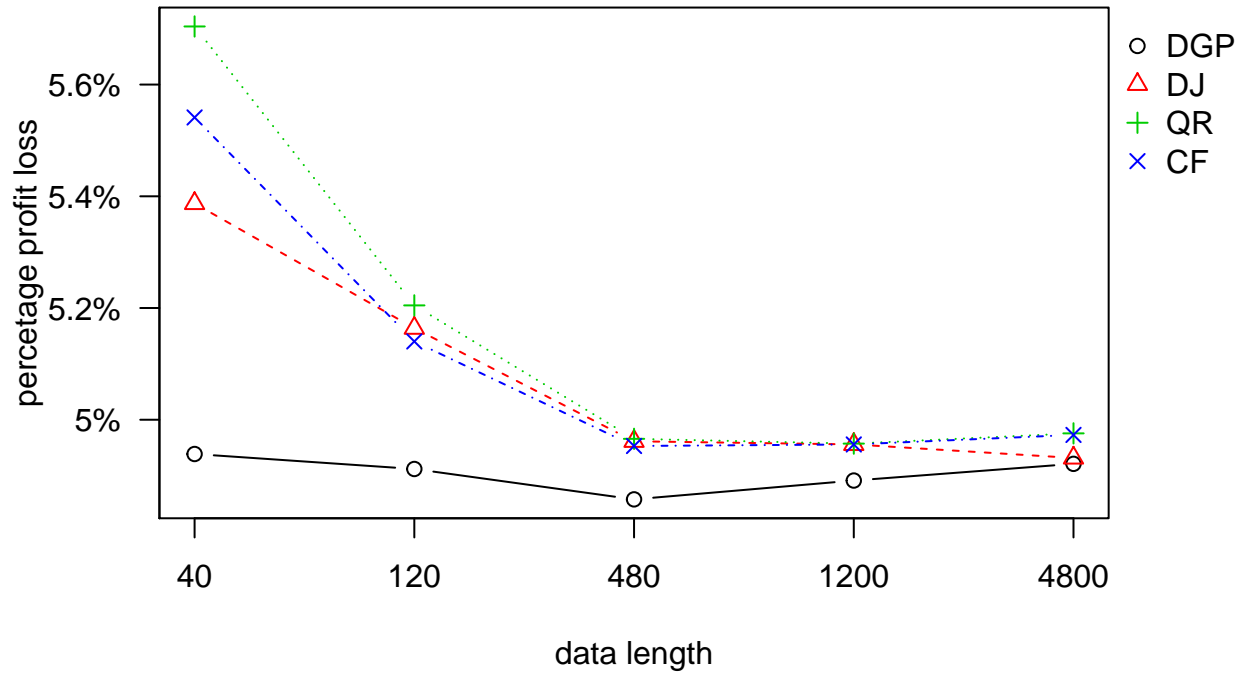


linear norm plot

Joshua

15/05/2020



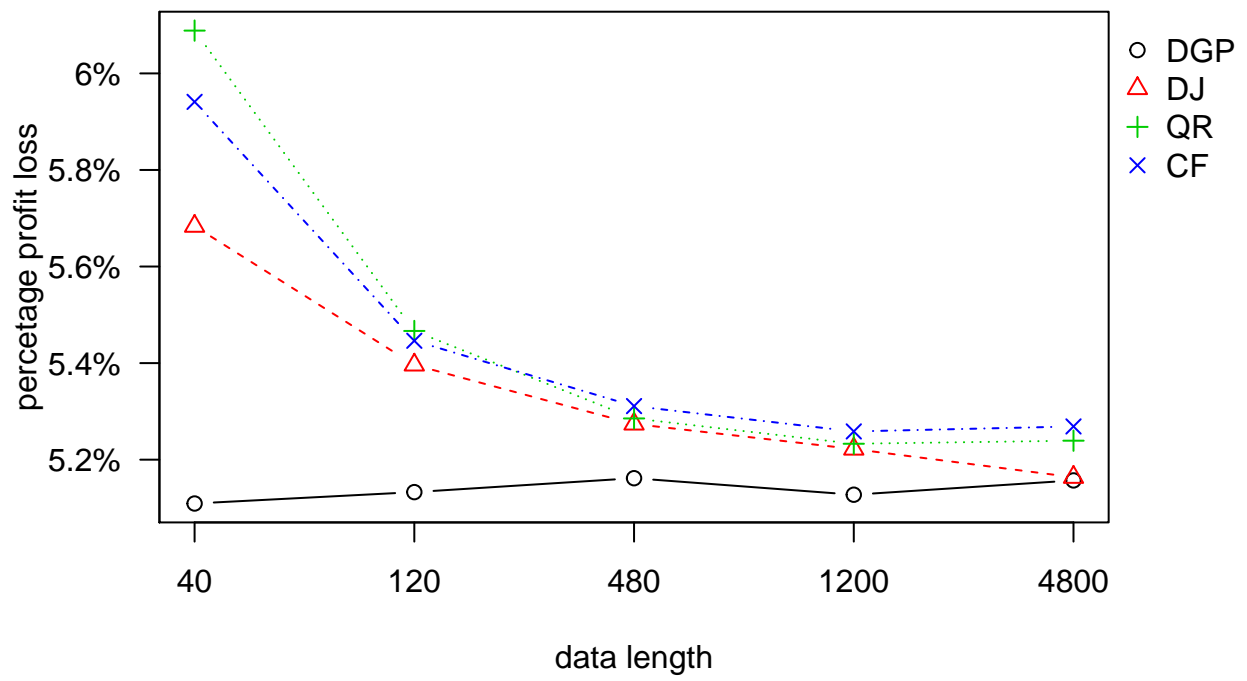
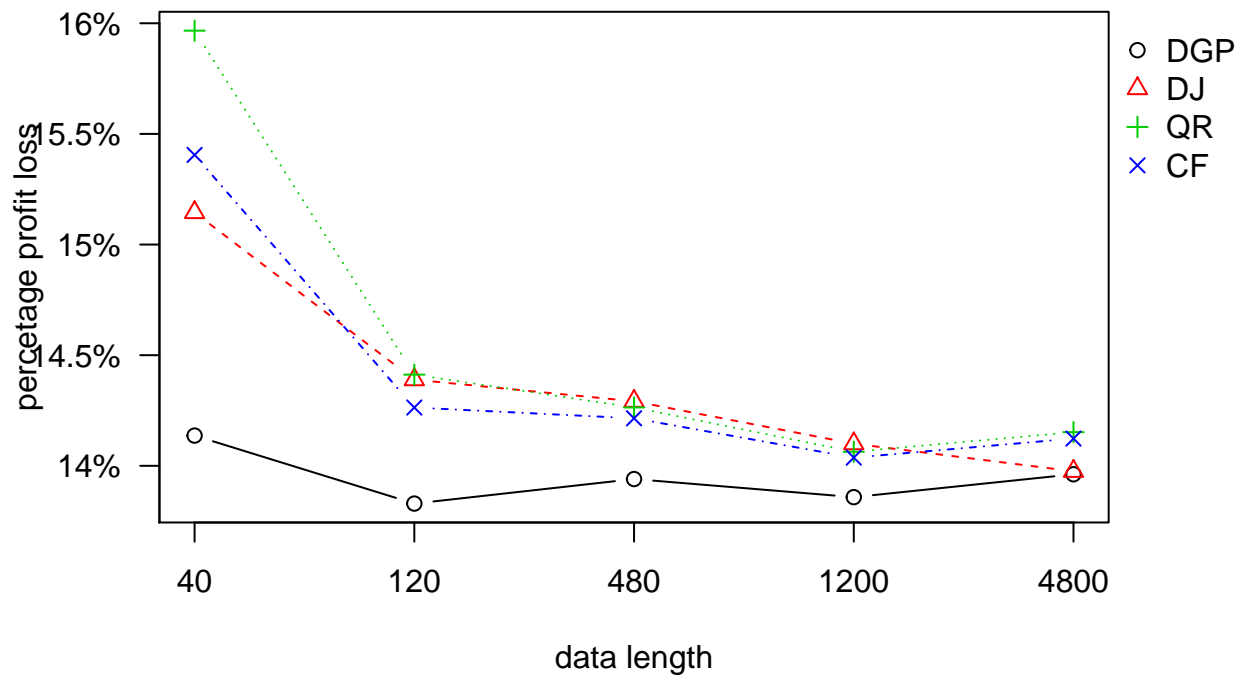


Table 1: Inventory Error

| 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 | 1.99 | 34.09 | 1.77 | 1.8 | -87.26 | -44.73 | -58.01 | -60.16 | 135.95 | 151.65 | 107.54 | 96.34 |
| | (200.66) | (222.63) | (233.39) | (226.28) | (199.72) | (221) | (233.15) | (224.07) | (200.51) | (223.65) | (236.36) | (227.96) |
| 120 | 1.61 | 14.04 | 1.92 | 1.58 | -76.12 | -61.38 | -70.2 | -67.3 | 115.28 | 125.84 | 107.83 | 102.9 |
| | (200.56) | (212.8) | (212.98) | (210.31) | (198.48) | (209.98) | (209.11) | (207.2) | (200.07) | (211.26) | (212.48) | (209.84) |
| 480 | 0.47 | 3.17 | 0.59 | 0.6 | -71.02 | -68.82 | -70.1 | -68.51 | 107.98 | 112.69 | 106.75 | 104.49 |
| | (198.72) | (204.03) | (203.36) | (202.68) | (200.36) | (206.53) | (205.13) | (204.73) | (199.38) | (205.06) | (204.3) | (204.23) |
| 1200 | -2.38 | -0.47 | -2.48 | -2.5 | -70.72 | -70.91 | -71.07 | -69.76 | 105.82 | 109.25 | 106.58 | 104.52 |
| | (199.39) | (203.18) | (202.09) | (202.03) | (199.34) | (203.33) | (202.4) | (202.48) | (199.16) | (203.65) | (202.63) | (202.71) |
| 4800 | -1.55 | -1.16 | -1.56 | -1.54 | -70.97 | -70.85 | -71.33 | -70.19 | 104.47 | 104.92 | 105.5 | 103.93 |
| | (200.29) | (200.87) | (202.44) | (202.35) | (200.37) | (200.67) | (202.96) | (202.96) | (200.04) | (200.5) | (202.81) | (203.12) |

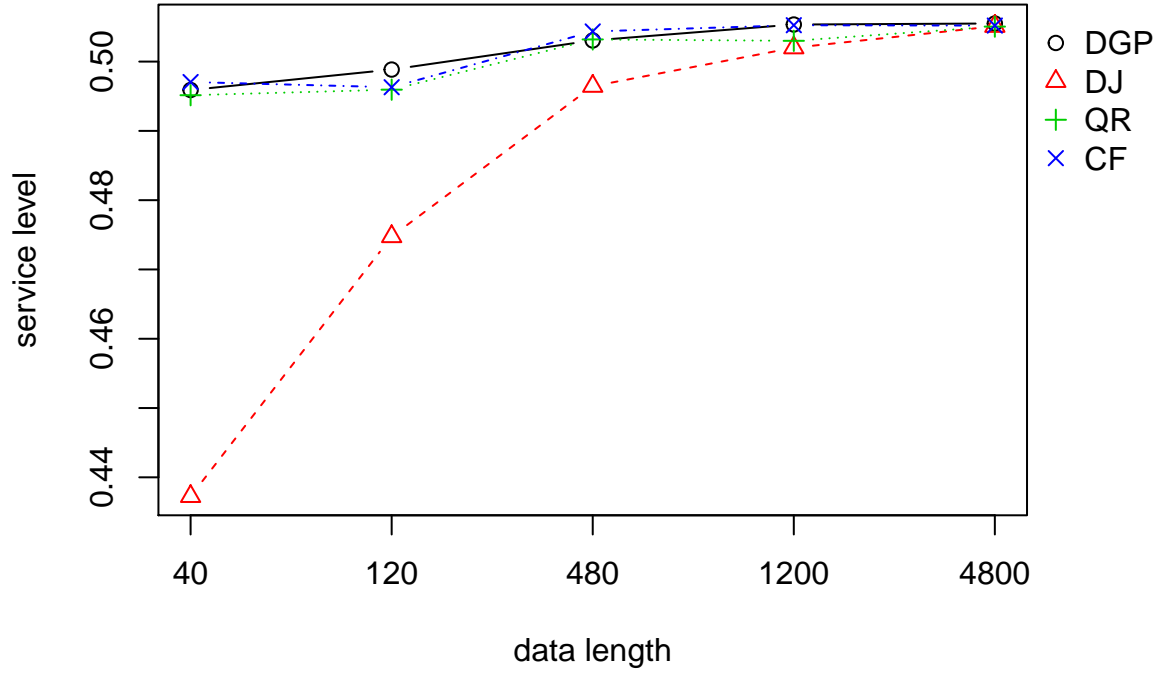
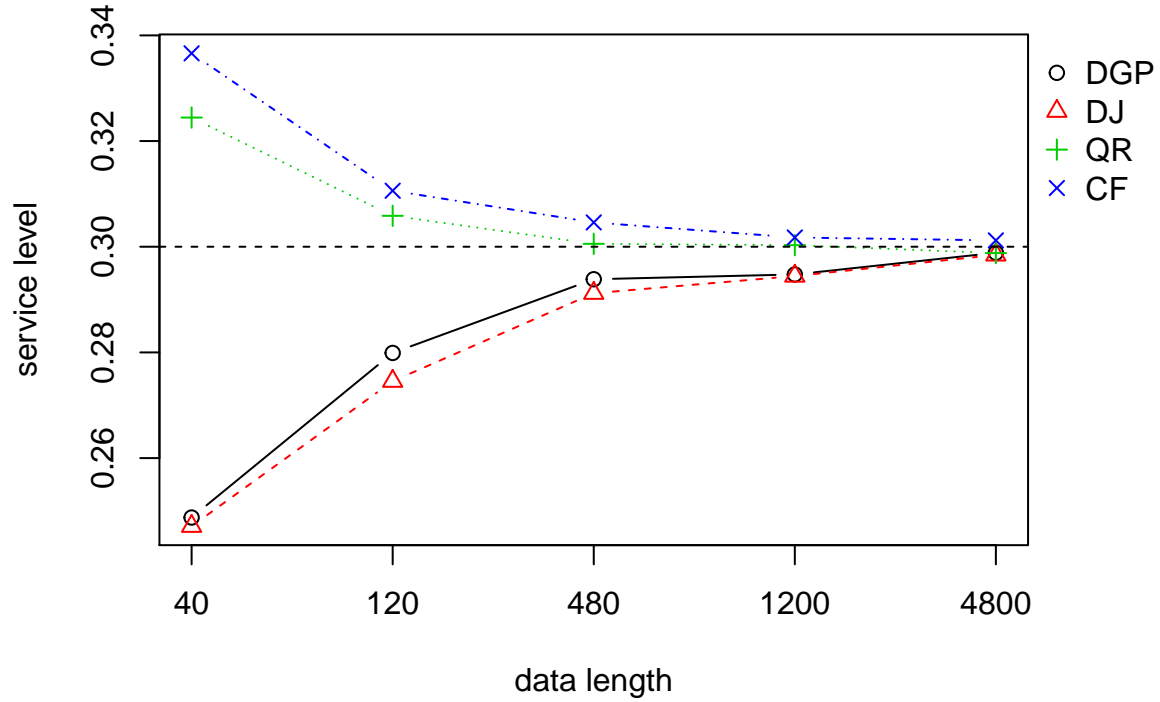
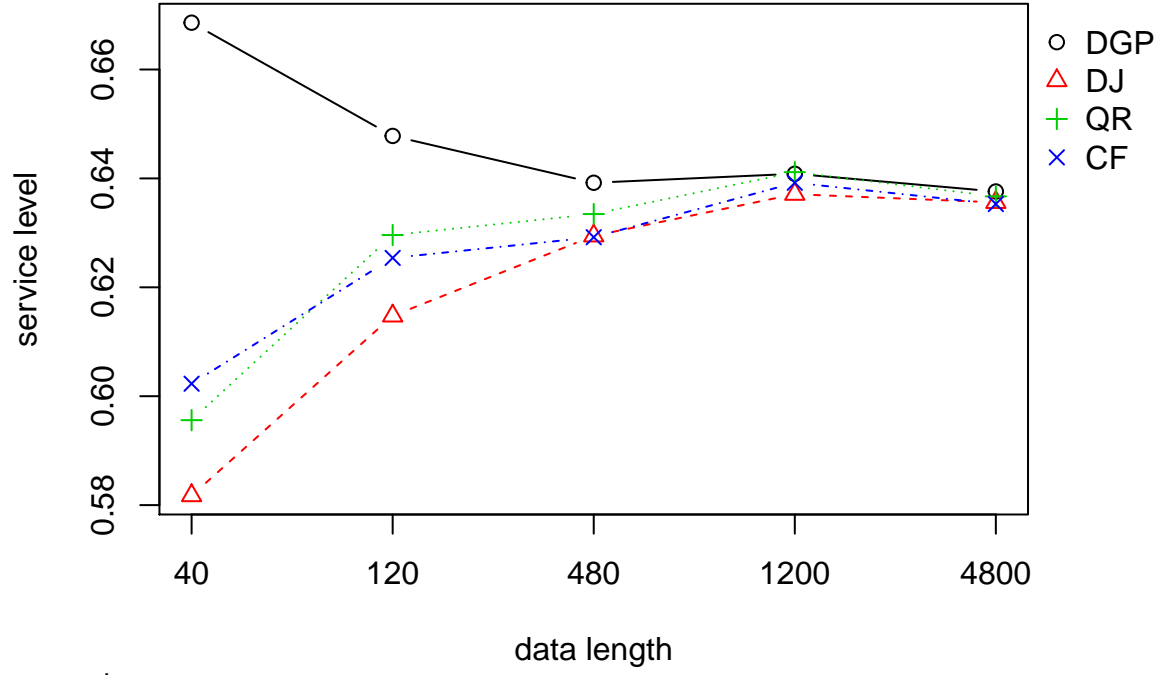


Table 2: p-value of Wilcoxon Test between data size 1200 and 4800

| Target service level | DGP | disjoint | quantile | proposed |
|----------------------|-----------|-----------|-----------|-----------|
| 0.5 | 0.9760663 | 0.5352529 | 0.6818003 | 0.9920214 |
| 0.63 | 0.4985604 | 0.7551821 | 0.3542025 | 0.4172805 |
| 0.3 | 0.3694827 | 0.3811101 | 0.7433179 | 0.9046018 |



##

DGP

DJ

QR

CF

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

| Target service level | Percentage profit loss | | | | Service level | | | |
|----------------------|------------------------|----------|----------|----------|---------------|----------|----------|----------|
| | DGP | disjoint | quantile | proposed | DGP | disjoint | quantile | proposed |
| 0.5 | 4.9% | 5.4% | 5.7% | 5.5% | 0.50 | 0.44 | 0.50 | 0.50 |
| 0.63 | 14.1% | 15.1% | 16.0% | 15.4% | 0.67 | 0.58 | 0.60 | 0.60 |
| 0.3 | 5.1% | 5.7% | 6.1% | 5.9% | 0.25 | 0.25 | 0.32 | 0.34 |

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

| Target service level | Percentage profit loss | | | | Service level | | | |
|----------------------|------------------------|----------|----------|----------|---------------|----------|----------|----------|
| | DGP | disjoint | quantile | proposed | DGP | disjoint | quantile | proposed |
| 0.5 | 4.9% | 5.0% | 5.0% | 5.0% | 0.50 | 0.50 | 0.50 | 0.50 |
| 0.63 | 13.9% | 14.3% | 14.3% | 14.2% | 0.64 | 0.63 | 0.63 | 0.63 |
| 0.3 | 5.2% | 5.3% | 5.3% | 5.3% | 0.29 | 0.29 | 0.30 | 0.30 |

```
## 40 0.9509822 0.9326736 0.9418560 0.9437461
## 120 0.9513125 0.9430230 0.9479289 0.9487688
## 480 0.9521728 0.9494005 0.9510724 0.9512184
## 1200 0.9529062 0.9510938 0.9523572 0.9523857
## 4800 0.9522511 0.9518940 0.9518412 0.9518687

##          DGP          DJ          QR          CF
## 40 0.9745391 0.9581833 0.9594383 0.9619832
## 120 0.9726712 0.9658907 0.9688581 0.9684646
## 480 0.9709970 0.9686659 0.9696528 0.9691997
## 1200 0.9712115 0.9700645 0.9706703 0.9702015
## 4800 0.9710673 0.9709000 0.9705871 0.9701629

##          DGP          DJ          QR          CF
## 40 0.8952578 0.8797266 0.8997386 0.9074440
## 120 0.9055669 0.8965015 0.9062160 0.9095336
## 480 0.9089606 0.9047315 0.9087081 0.9102422
## 1200 0.9101748 0.9070673 0.9091198 0.9105759
## 4800 0.9108143 0.9103921 0.9098343 0.9109945
```

```
\begin{table}
```

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

| Data size | Percentage profit loss | | | | Service level | | | | Fill rate | | | |
|-----------|------------------------|----------|----------|----------|---------------|----------|----------|----------|-----------|----------|----------|----------|
| | DGP | disjoint | quantile | proposed | DGP | disjoint | quantile | proposed | DGP | disjoint | quantile | proposed |
| 40 | 5.1% | 5.7% | 6.1% | 5.9% | 0.25 | 0.25 | 0.32 | 0.34 | 89.5% | 88.0% | 90.0% | 90.7% |
| 120 | 5.1% | 5.4% | 5.5% | 5.4% | 0.28 | 0.27 | 0.31 | 0.31 | 90.6% | 89.7% | 90.6% | 91.0% |
| 480 | 5.2% | 5.3% | 5.3% | 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% | 5.3% | 0.29 | 0.29 | 0.30 | 0.30 | 91.0% | 90.7% | 90.9% | 91.1% |
| 4800 | 5.2% | 5.2% | 5.2% | 5.3% | 0.30 | 0.30 | 0.30 | 0.30 | 91.1% | 91.0% | 91.0% | 91.1% |

```
\end{table}
```

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

| Target service level | Percentage profit loss | | | | Service level | | | |
|----------------------|------------------------|----------|----------|----------|---------------|----------|----------|----------|
| | DGP | disjoint | quantile | proposed | DGP | disjoint | quantile | proposed |
| 0.5 | 4.9% | 4.9% | 5.0% | 5.0% | 0.51 | 0.51 | 0.51 | 0.51 |
| 0.63 | 14.0% | 14.0% | 14.2% | 14.1% | 0.64 | 0.64 | 0.64 | 0.64 |
| 0.3 | 5.2% | 5.2% | 5.2% | 5.3% | 0.30 | 0.30 | 0.30 | 0.30 |