Model comp

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LOOCV

```
compare(loo.c2.5,loo.c1)
```

```
## elpd_diff        se
##     202.2      56.3
```

Here $elpd_diff - 2se$ does not include zero, and the difference is postive, hence the model(cubic $I = 1$) is preferred.

```
compare(loo.c1,loo.q1)
```

```
## elpd_diff        se
##      63.8      15.4
```

Here $elpd_diff - 2se$ does not include zero, and the difference is postive, hence the model(quadratic $I = 1$) is preferred. But it seems less smooth.

Pareto k diagnostic for 4 models are listed as following, where $c2.5$ means cubic splines with interval length 2.5 years, $q1$ means quadratic splines with interval length 1 year.

```
print(loo.c2.5)
```

```
##
## Computed from 4000 by 1371 log-likelihood matrix
##
##          Estimate    SE
## elpd_loo    465.2  78.5
## p_loo       505.4  48.7
## looic      -930.4 156.9
## ------
## Monte Carlo SE of elpd_loo is NA.
##
## Pareto k diagnostic values:
##                            Count Pct.    Min. n_eff
## (-Inf, 0.5]   (good)     1069  78.0%   223
##  (0.5, 0.7]   (ok)        193  14.1%   97
##    (0.7, 1]   (bad)        88   6.4%   11
##    (1, Inf)   (very bad)   21   1.5%   1
## See help('pareto-k-diagnostic') for details.
```

```
print(loo.q2.5)
```

```
##
## Computed from 4000 by 1371 log-likelihood matrix
##
##          Estimate    SE
## elpd_loo    372.2 113.0
## p_loo       549.2  66.5
## looic      -744.5 225.9
## ------
## Monte Carlo SE of elpd_loo is NA.
```

```
##
## Pareto k diagnostic values:
##                          Count Pct.    Min. n_eff
## (-Inf, 0.5]   (good)     1068  77.9%   429
##  (0.5, 0.7]   (ok)        194  14.2%   64
##    (0.7, 1]   (bad)        93   6.8%   15
##    (1, Inf)   (very bad)   16   1.2%   1
## See help('pareto-k-diagnostic') for details.
```

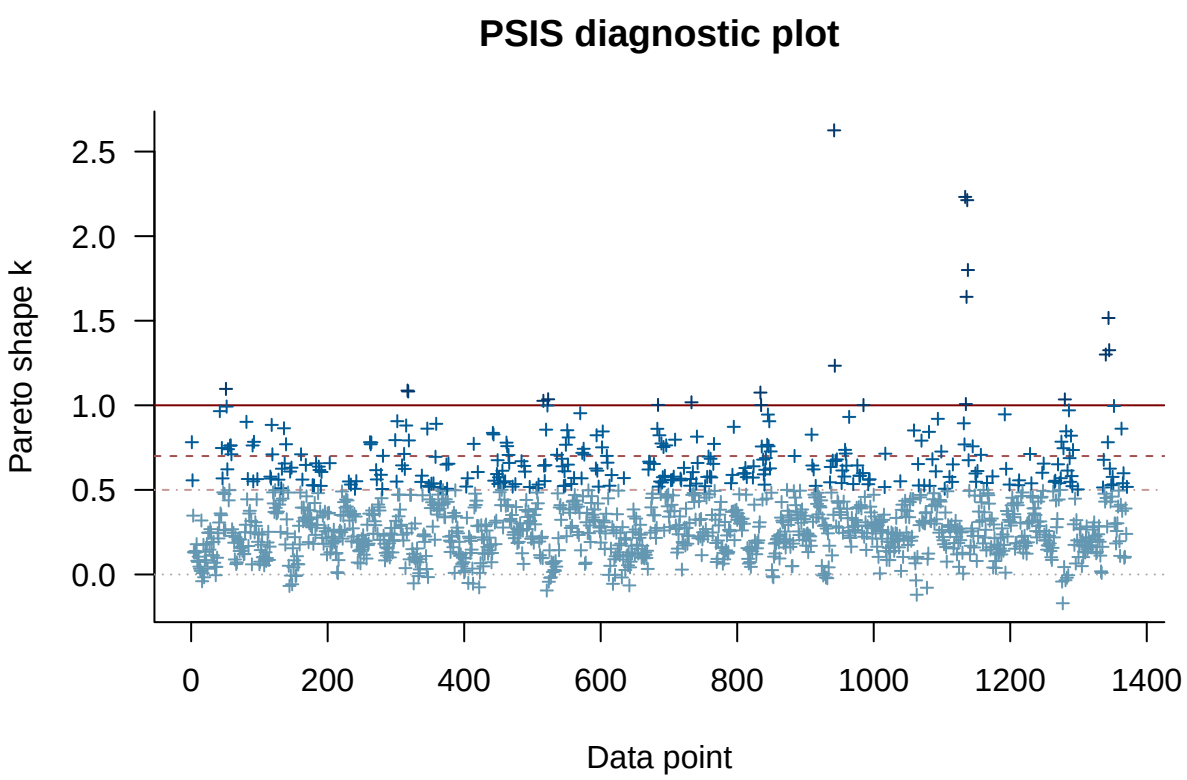
```
print(loo.c1)
```

```
##
## Computed from 4000 by 1371 log-likelihood matrix
##
##          Estimate   SE
## elpd_loo    667.4 45.4
## p_loo       444.8 28.1
## looic     -1334.9 90.7
## ------
## Monte Carlo SE of elpd_loo is NA.
##
## Pareto k diagnostic values:
##                          Count Pct.    Min. n_eff
## (-Inf, 0.5]   (good)     961   70.1%   494
##  (0.5, 0.7]   (ok)       246   17.9%   79
##    (0.7, 1]   (bad)      130    9.5%   14
##    (1, Inf)   (very bad)  34    2.5%   2
## See help('pareto-k-diagnostic') for details.
```

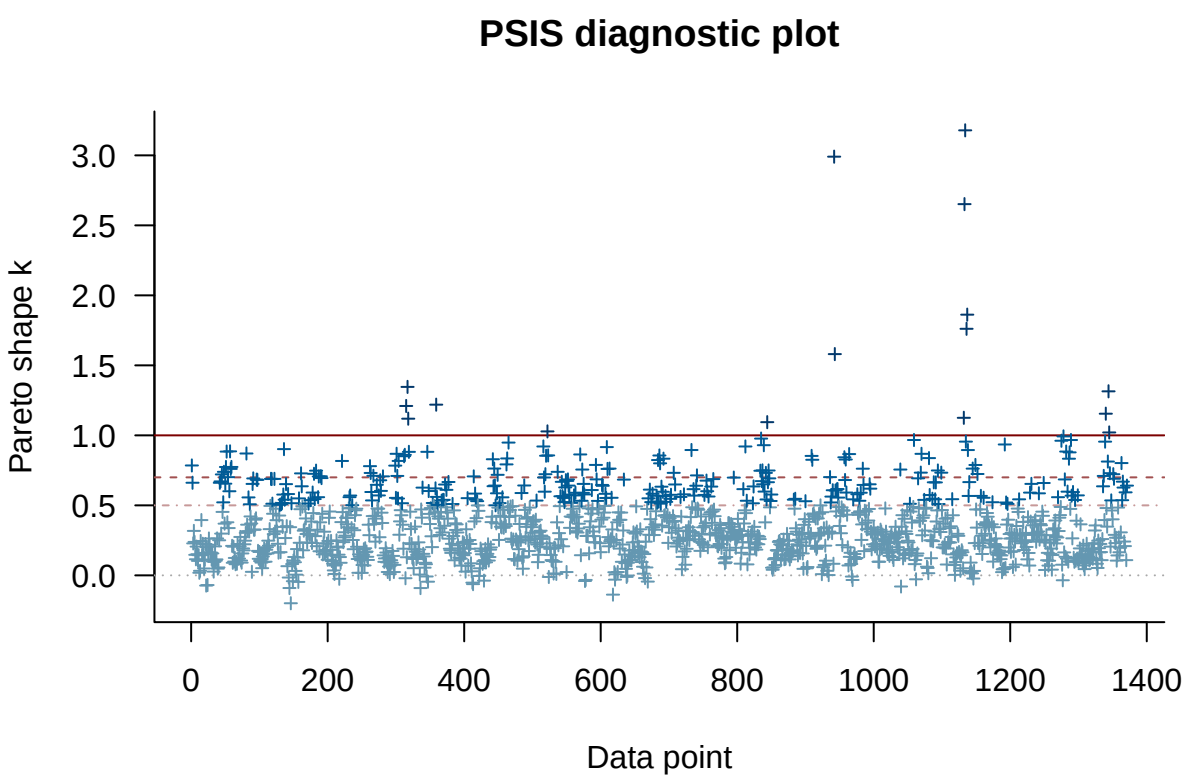
```
print(loo.q1)
```

```
##
## Computed from 4000 by 1371 log-likelihood matrix
##
##          Estimate   SE
## elpd_loo    731.2 42.6
## p_loo       402.3 22.3
## looic     -1462.4 85.3
## ------
## Monte Carlo SE of elpd_loo is NA.
##
## Pareto k diagnostic values:
##                          Count Pct.    Min. n_eff
## (-Inf, 0.5]   (good)     926   67.5%   178
##  (0.5, 0.7]   (ok)       250   18.2%   94
##    (0.7, 1]   (bad)      170   12.4%   16
##    (1, Inf)   (very bad)  25    1.8%   1
## See help('pareto-k-diagnostic') for details.
```

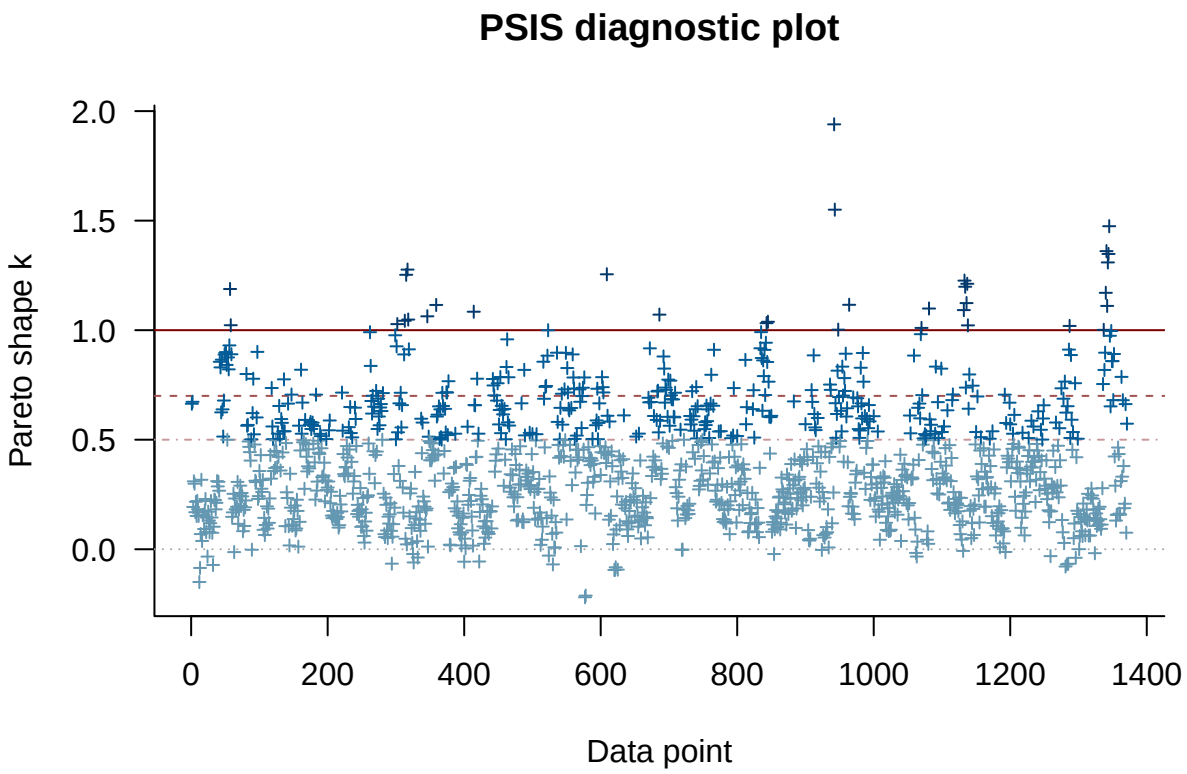
```
plot(loo.c2.5)
```


PSIS diagnostic plot
Pareto shape k
2.5
2.0
1.5
1.0
0.5
0.0
0
200
400
600
800
1000
1200
1400
Data point

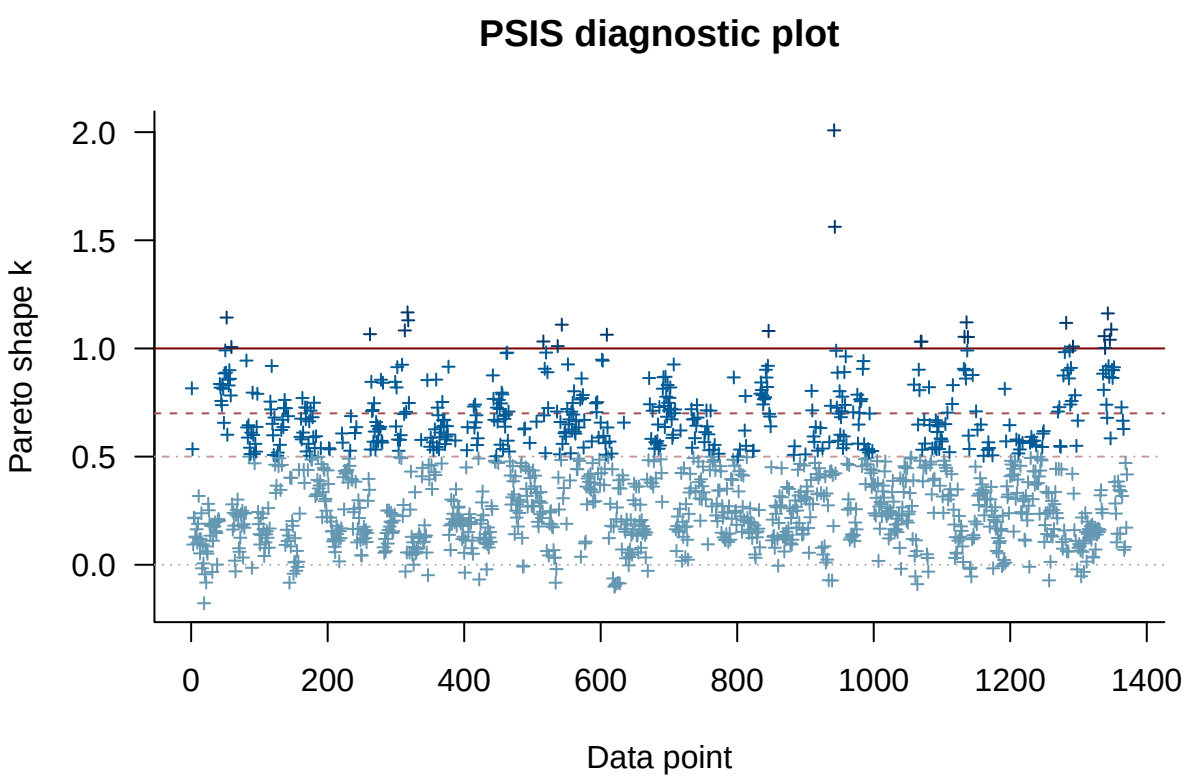
```
plot(loo.q2.5)
```


PSIS diagnostic plot
Pareto shape k
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
200
400
600
800
1000
1200
1400
Data point

```
plot(loo.c1)
```


PSIS diagnostic plot
Pareto shape k
2.0
1.5
1.0
0.5
0.0
0
200
400
600
800
1000
1200
1400
Data point

```
plot(loo.q1)
```


PSIS diagnostic plot
Pareto shape k
2.0
1.5
1.0
0.5
0.0
0
200
400
600
800
1000
1200
1400
Data point