

# Results of the experiments on the 7 artificial datasets

Associated with the KDD'11 submission  
"2D-Interval Predictions for Time Series"

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March 3, 2011

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# Chapter 1

## Window Size 10

This chapter presents the results for the 7 artificial datasets (streams) for the window size of 10 values,  $k = 10$ .

### 1.1 Stream 1

#### 1.1.1 MAQ - Mean Absolute Quantile Deviation

Figure 1.1 shows the results using the MAQ error measure for all different setups.

Table 1.1 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile RF ntree 500	2.86	2.95	2.91
Quantile RF ntree 1000	2.87	2.95	2.91
Quantile RF ntree 1500	2.87	2.95	2.91
Nmodels RF ntree 1000	3.03	2.96	3
Nmodels RF ntree 500	3.03	2.97	3
Nmodels RF ntree 1500	3.04	2.96	3
Quantile SVM cost 50 gamma 0.1	3.05	3.08	3.07
Nmodels SVM cost 50 gamma 0.1	3.06	3.09	3.07
Quantile SVM cost 10 gamma 0.1	2.98	3.17	3.08
Nmodels SVM cost 100 gamma 0.1	3.07	3.1	3.08
Nmodels SVM cost 100 gamma 0.01	3.13	3.06	3.09
Nmodels SVM cost 50 gamma 0.01	3.14	3.06	3.1
Quantile SVM cost 50 gamma 0.05	3	3.2	3.1
Quantile SVM cost 100 gamma 0.01	3.03	3.17	3.1
Quantile SVM cost 50 gamma 0.01	3.04	3.17	3.11
Nmodels SVM cost 100 gamma 0.05	3.05	3.17	3.11

Nmodels SVM cost 10 gamma 0.1	3.06	3.15	3.11
Nmodels SVM cost 50 gamma 0.05	3.06	3.17	3.12
Quantile SVM cost 100 gamma 0.05	3.06	3.2	3.13
Quantile SVM cost 100 gamma 0.1	3.11	3.15	3.13
Quantile SVM cost 10 gamma 0.05	3.03	3.24	3.13
Quantile SVM cost 5 gamma 0.1	3.03	3.25	3.14
Nmodels SVM cost 10 gamma 0.05	3.1	3.23	3.17
Quantile SVM cost 100 gamma 0.001	3.17	3.17	3.17
Nmodels SVM cost 5 gamma 0.1	3.12	3.23	3.17
Quantile SVM cost 5 gamma 0.05	3.08	3.3	3.19
Quantile SVM cost 10 gamma 0.01	3.16	3.26	3.21
Nmodels SVM cost 100 gamma 0.001	3.25	3.2	3.22
Nmodels SVM cost 5 gamma 0.05	3.18	3.27	3.23
Nmodels SVM cost 10 gamma 0.01	3.24	3.22	3.23
Nmodels RT se 0	3.26	3.32	3.29
Quantile SVM cost 50 gamma 0.001	3.3	3.3	3.3
Nmodels QRF ntree 1000	3.23	3.39	3.31
Nmodels QRF ntree 1500	3.23	3.39	3.31
Nmodels QRF ntree 500	3.23	3.39	3.31
Quantile SVM cost 5 gamma 0.01	3.28	3.36	3.32
Nmodels SVM cost 50 gamma 0.001	3.34	3.31	3.33
Nmodels RT se 0.5	3.31	3.35	3.33
Nmodels SVM cost 5 gamma 0.01	3.33	3.35	3.34
Quantile QRF ntree 1000	3.27	3.48	3.37
Quantile QRF ntree 1500	3.28	3.47	3.37
Quantile QRF ntree 500	3.27	3.49	3.38
Quantile SVM cost 1 gamma 0.1	3.3	3.48	3.39
Nmodels SVM cost 1 gamma 0.1	3.37	3.41	3.39
Nmodels RT se 1	3.39	3.45	3.42
Nmodels RT se 1.5	3.42	3.51	3.46
Quantile SVM cost 1 gamma 0.05	3.41	3.57	3.49
Nmodels SVM cost 1 gamma 0.05	3.46	3.54	3.5
Quantile RT se 0	3.53	3.5	3.52
Iterated SVM cost 100 gamma 0.001	3.59	3.44	3.52
Iterated SVM cost 50 gamma 0.001	3.59	3.47	3.53
Iterated SVM cost 10 gamma 0.01	3.69	3.54	3.62
Quantile RT se 0.5	3.69	3.58	3.63
Iterated SVM cost 5 gamma 0.01	3.71	3.58	3.64
Quantile RT se 1	3.74	3.62	3.68
Iterated SVM cost 50 gamma 0.01	3.72	3.66	3.69
Quantile SVM cost 10 gamma 0.001	3.67	3.71	3.69

Quantile SVM cost 1 gamma 0.01	3.65	3.76	3.7
Nmodels SVM cost 1 gamma 0.01	3.72	3.73	3.72
Nmodels SVM cost 10 gamma 0.001	3.75	3.73	3.74
Iterated SVM cost 100 gamma 0.01	3.76	3.72	3.74
Quantile RT se 1.5	3.77	3.73	3.75
Iterated SVM cost 10 gamma 0.001	3.81	3.76	3.79
Iterated RT se 0	3.92	3.91	3.91
Iterated SVM cost 5 gamma 0.001	3.91	3.92	3.92
Quantile SVM cost 5 gamma 0.001	3.89	3.97	3.93
Iterated RT se 0.5	3.88	3.97	3.93
Iterated SVM cost 1 gamma 0.01	3.97	3.91	3.94
Iterated RT se 1	3.88	4.02	3.95
Iterated RT se 1.5	3.9	4.03	3.97
Nmodels SVM cost 5 gamma 0.001	3.97	3.97	3.97
Iterated SVM cost 5 gamma 0.05	4.05	3.92	3.99
Iterated QRF ntree 1000	3.92	4.1	4.01
Iterated QRF ntree 1500	3.92	4.1	4.01
Iterated QRF ntree 500	3.93	4.11	4.02
Iterated SVM cost 10 gamma 0.05	4.13	3.93	4.03
Iterated SVM cost 50 gamma 0.05	4.17	3.93	4.05
Iterated SVM cost 100 gamma 0.05	4.14	3.98	4.06
Iterated SVM cost 1 gamma 0.05	4.08	4.05	4.07
Iterated RF ntree 1000	4.05	4.15	4.1
Iterated RF ntree 1500	4.06	4.14	4.1
Iterated RF ntree 500	4.06	4.16	4.11
Iterated SVM cost 100 gamma 0.1	4.51	3.98	4.24
Iterated SVM cost 1 gamma 0.1	4.43	4.11	4.27
Iterated SVM cost 50 gamma 0.1	4.58	4.01	4.29
Iterated SVM cost 5 gamma 0.1	4.58	4.08	4.33
Iterated SVM cost 10 gamma 0.1	4.64	4.06	4.35
Iterated SVM cost 1 gamma 0.001	4.23	4.53	4.38
Quantile SVM cost 1 gamma 0.001	4.46	4.62	4.54
Nmodels SVM cost 1 gamma 0.001	4.45	4.65	4.55
RW	26.05	9.9	17.97

Table 1.1: All setups MAQ

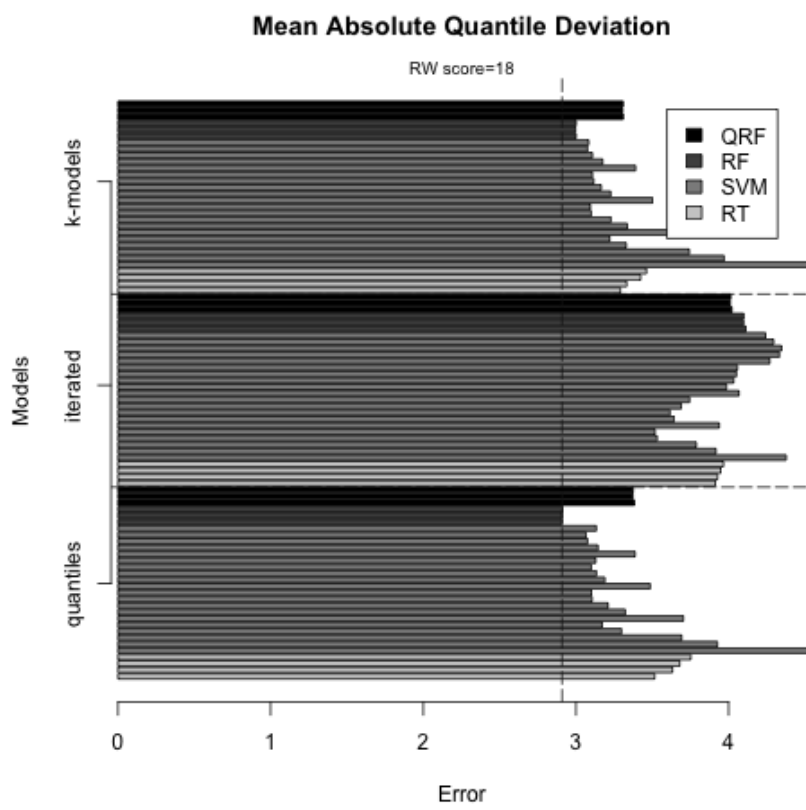


Figure 1.1: Stream 1



### 1.1.2 TQE - Total Quantile Error

Figure 1.2 shows the results using the TQE error measure for all different setups.

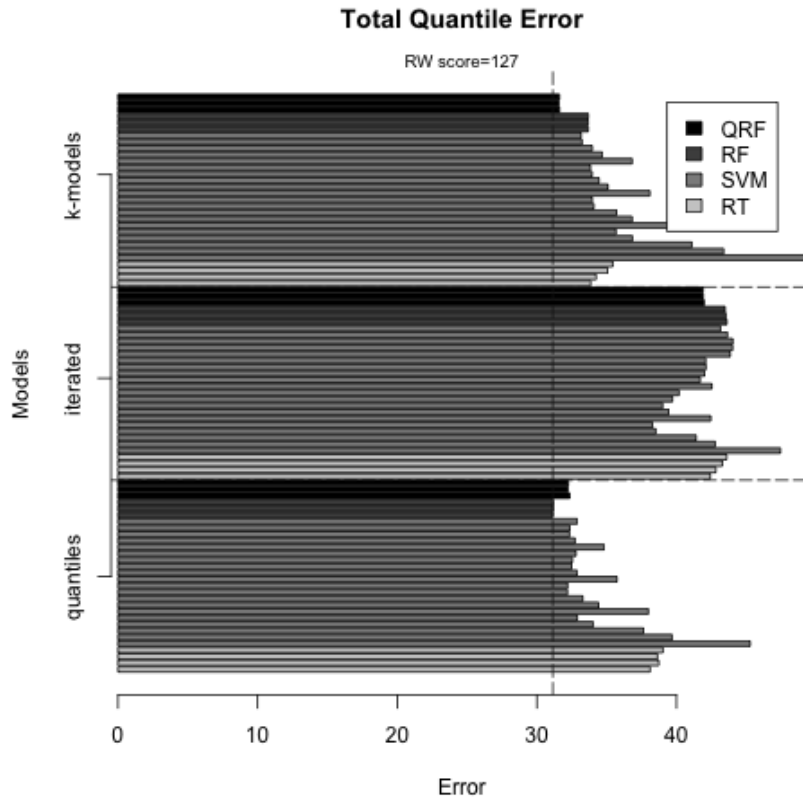


Figure 1.2: Stream 1

Table 1.2 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile RF ntree 500	15.94	15.2	31.14
Quantile RF ntree 1000	15.98	15.18	31.16
Quantile RF ntree 1500	15.99	15.19	31.18
Nmodels QRF ntree 1000	15.92	15.65	31.58
Nmodels QRF ntree 1500	15.93	15.68	31.61
Nmodels QRF ntree 500	15.94	15.68	31.62
Quantile SVM cost 50 gamma 0.01	15.99	16.2	32.19

Quantile SVM cost 100 gamma 0.01	15.93	16.27	32.2
Quantile QRF ntree 1000	16.28	15.94	32.22
Quantile QRF ntree 1500	16.31	15.94	32.25
Quantile SVM cost 10 gamma 0.1	15.87	16.47	32.34
Quantile SVM cost 50 gamma 0.1	16.07	16.28	32.35
Quantile QRF ntree 500	16.32	16.05	32.37
Quantile SVM cost 10 gamma 0.05	16.09	16.39	32.49
Quantile SVM cost 50 gamma 0.05	16.01	16.54	32.54
Quantile SVM cost 5 gamma 0.1	16.07	16.66	32.73
Quantile SVM cost 100 gamma 0.05	16.19	16.61	32.8
Quantile SVM cost 100 gamma 0.1	16.29	16.59	32.88
Quantile SVM cost 5 gamma 0.05	16.4	16.48	32.88
Quantile SVM cost 100 gamma 0.001	16.49	16.4	32.89
Nmodels SVM cost 100 gamma 0.1	16.56	16.61	33.17
Nmodels SVM cost 50 gamma 0.1	16.65	16.58	33.23
Quantile SVM cost 10 gamma 0.01	16.72	16.57	33.29
Nmodels RF ntree 1000	17.66	16	33.66
Nmodels RF ntree 500	17.65	16.02	33.67
Nmodels RF ntree 1500	17.68	16	33.68
Nmodels SVM cost 100 gamma 0.05	16.89	16.95	33.84
Nmodels RT se 0	17.14	16.71	33.85
Nmodels SVM cost 50 gamma 0.05	16.99	16.97	33.96
Nmodels SVM cost 100 gamma 0.01	17.42	16.55	33.97
Nmodels SVM cost 10 gamma 0.1	17.03	16.94	33.97
Quantile SVM cost 50 gamma 0.001	17.18	16.84	34.02
Nmodels SVM cost 50 gamma 0.01	17.51	16.58	34.08
Nmodels RT se 0.5	17.33	16.91	34.24
Quantile SVM cost 5 gamma 0.01	17.47	16.95	34.42
Nmodels SVM cost 10 gamma 0.05	17.31	17.14	34.45
Nmodels SVM cost 5 gamma 0.1	17.35	17.34	34.68
Quantile SVM cost 1 gamma 0.1	17.36	17.46	34.81
Nmodels RT se 1	17.67	17.4	35.07
Nmodels SVM cost 5 gamma 0.05	17.79	17.3	35.09
Nmodels RT se 1.5	17.81	17.62	35.43
Nmodels SVM cost 100 gamma 0.001	18.03	17.63	35.66
Nmodels SVM cost 10 gamma 0.01	18.25	17.45	35.7
Quantile SVM cost 1 gamma 0.05	18.1	17.64	35.74
Nmodels SVM cost 1 gamma 0.1	18.71	18.11	36.82
Nmodels SVM cost 5 gamma 0.01	18.88	17.94	36.82
Nmodels SVM cost 50 gamma 0.001	18.71	18.13	36.84
Quantile SVM cost 10 gamma 0.001	19.29	18.36	37.64

Quantile SVM cost 1 gamma 0.01	19.79	18.2	37.99
Nmodels SVM cost 1 gamma 0.05	19.52	18.58	38.09
Quantile RT se 0	19.67	18.44	38.11
Iterated SVM cost 100 gamma 0.001	19.38	18.89	38.27
Iterated SVM cost 50 gamma 0.001	19.45	19.07	38.51
Quantile RT se 1	19.76	18.88	38.64
Quantile RT se 0.5	19.94	18.79	38.73
Iterated SVM cost 10 gamma 0.01	19.86	19.15	39.01
Quantile RT se 1.5	19.58	19.44	39.03
Iterated SVM cost 5 gamma 0.01	20.02	19.41	39.44
Quantile SVM cost 5 gamma 0.001	20.47	19.21	39.68
Iterated SVM cost 50 gamma 0.01	19.94	19.77	39.71
Iterated SVM cost 100 gamma 0.01	20.09	20.09	40.18
Nmodels SVM cost 1 gamma 0.01	21.47	19.41	40.88
Nmodels SVM cost 10 gamma 0.001	21.24	19.86	41.1
Iterated SVM cost 10 gamma 0.001	20.95	20.46	41.4
Iterated SVM cost 5 gamma 0.05	20.22	21.48	41.69
Iterated QRF ntree 1500	21.11	20.79	41.9
Iterated QRF ntree 1000	21.11	20.81	41.91
Iterated QRF ntree 500	21.12	20.86	41.98
Iterated SVM cost 10 gamma 0.05	20.31	21.71	42.02
Iterated SVM cost 100 gamma 0.05	20.21	21.88	42.09
Iterated SVM cost 50 gamma 0.05	20.38	21.73	42.11
Iterated RT se 0	21.43	20.99	42.42
Iterated SVM cost 1 gamma 0.01	21.72	20.74	42.46
Iterated SVM cost 1 gamma 0.05	20.9	21.63	42.53
Iterated SVM cost 5 gamma 0.001	21.59	21.17	42.77
Iterated RT se 0.5	21.31	21.5	42.82
Iterated SVM cost 100 gamma 0.1	21.17	21.98	43.15
Iterated RT se 1	21.46	21.82	43.28
Nmodels SVM cost 5 gamma 0.001	22.57	20.81	43.38
Iterated RF ntree 1500	22.39	21.09	43.48
Iterated RF ntree 1000	22.38	21.15	43.54
Iterated RT se 1.5	21.64	21.95	43.59
Iterated RF ntree 500	22.44	21.17	43.6
Iterated SVM cost 50 gamma 0.1	21.5	22.15	43.65
Iterated SVM cost 1 gamma 0.1	21.41	22.44	43.85
Iterated SVM cost 5 gamma 0.1	21.42	22.6	44.02
Iterated SVM cost 10 gamma 0.1	21.52	22.51	44.03
Quantile SVM cost 1 gamma 0.001	23.3	21.98	45.27
Iterated SVM cost 1 gamma 0.001	23.29	24.15	47.45

Nmodels SVM cost 1 gamma 0.001	25.5	24.25	49.75
RW	76.79	50.14	126.93

Table 1.2: All setups TQE

### 1.1.3 Utility

Figure 1.3 shows the results using the Utility error measure (larger is better) for all different setups.

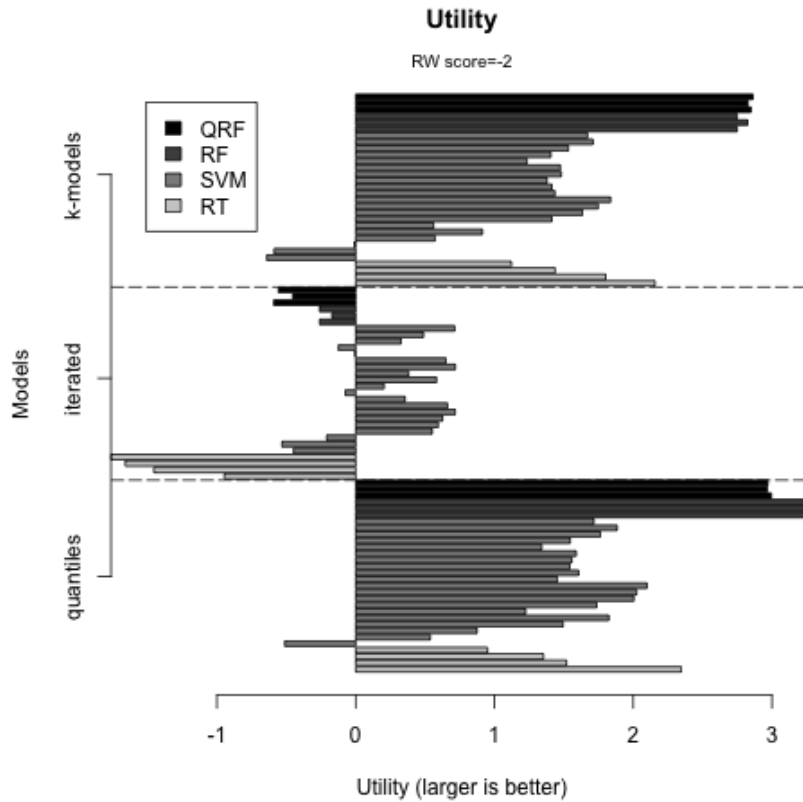


Figure 1.3: Stream 1

Table 1.3 shows all setups order by the Utility.

	utility
Quantile RF ntree 1000	3.29
Quantile RF ntree 500	3.26
Quantile RF ntree 1500	3.26
Quantile QRF ntree 500	3
Quantile QRF ntree 1500	2.97
Quantile QRF ntree 1000	2.97
Nmodels QRF ntree 1500	2.86

Nmodels QRF ntree 500	2.85
Nmodels QRF ntree 1000	2.83
Nmodels RF ntree 1000	2.82
Nmodels RF ntree 1500	2.75
Nmodels RF ntree 500	2.75
Quantile RT se 0	2.35
Nmodels RT se 0	2.16
Quantile SVM cost 100 gamma 0.01	2.1
Quantile SVM cost 50 gamma 0.01	2.02
Quantile SVM cost 10 gamma 0.01	2
Quantile SVM cost 50 gamma 0.1	1.88
Nmodels SVM cost 100 gamma 0.01	1.84
Quantile SVM cost 100 gamma 0.001	1.82
Nmodels RT se 0.5	1.8
Quantile SVM cost 10 gamma 0.1	1.76
Nmodels SVM cost 50 gamma 0.01	1.75
Quantile SVM cost 5 gamma 0.01	1.74
Quantile SVM cost 100 gamma 0.1	1.72
Nmodels SVM cost 50 gamma 0.1	1.71
Nmodels SVM cost 100 gamma 0.1	1.67
Nmodels SVM cost 10 gamma 0.01	1.63
Quantile SVM cost 5 gamma 0.05	1.61
Quantile SVM cost 100 gamma 0.05	1.59
Quantile SVM cost 50 gamma 0.05	1.56
Quantile SVM cost 5 gamma 0.1	1.55
Quantile SVM cost 10 gamma 0.05	1.54
Nmodels SVM cost 10 gamma 0.1	1.53
Quantile RT se 0.5	1.52
Quantile SVM cost 50 gamma 0.001	1.49
Nmodels SVM cost 50 gamma 0.05	1.48
Nmodels SVM cost 100 gamma 0.05	1.47
Quantile SVM cost 1 gamma 0.05	1.45
Nmodels RT se 1	1.44
Nmodels SVM cost 1 gamma 0.05	1.44
Nmodels SVM cost 5 gamma 0.05	1.41
Nmodels SVM cost 5 gamma 0.01	1.41
Nmodels SVM cost 5 gamma 0.1	1.41
Nmodels SVM cost 10 gamma 0.05	1.38
Quantile RT se 1	1.35
Quantile SVM cost 1 gamma 0.1	1.34
Nmodels SVM cost 1 gamma 0.1	1.23

Quantile SVM cost 1 gamma 0.01	1.23
Nmodels RT se 1.5	1.12
Quantile RT se 1.5	0.95
Nmodels SVM cost 100 gamma 0.001	0.91
Quantile SVM cost 10 gamma 0.001	0.87
Iterated SVM cost 50 gamma 0.05	0.72
Iterated SVM cost 5 gamma 0.01	0.72
Iterated SVM cost 100 gamma 0.1	0.71
Iterated SVM cost 10 gamma 0.01	0.66
Iterated SVM cost 100 gamma 0.05	0.65
Iterated SVM cost 1 gamma 0.01	0.63
Iterated SVM cost 100 gamma 0.001	0.59
Iterated SVM cost 5 gamma 0.05	0.58
Nmodels SVM cost 50 gamma 0.001	0.57
Nmodels SVM cost 1 gamma 0.01	0.56
Iterated SVM cost 50 gamma 0.001	0.55
Quantile SVM cost 5 gamma 0.001	0.54
Iterated SVM cost 50 gamma 0.1	0.49
Iterated SVM cost 10 gamma 0.05	0.38
Iterated SVM cost 50 gamma 0.01	0.36
Iterated SVM cost 10 gamma 0.1	0.33
Iterated SVM cost 1 gamma 0.05	0.2
Iterated SVM cost 1 gamma 0.1	-0.01
Nmodels SVM cost 10 gamma 0.001	-0.01
Iterated SVM cost 100 gamma 0.01	-0.07
Iterated SVM cost 5 gamma 0.1	-0.12
Iterated RF ntree 1000	-0.17
Iterated SVM cost 10 gamma 0.001	-0.21
Iterated RF ntree 500	-0.26
Iterated RF ntree 1500	-0.26
Iterated SVM cost 1 gamma 0.001	-0.45
Iterated QRF ntree 1000	-0.45
Quantile SVM cost 1 gamma 0.001	-0.51
Iterated SVM cost 5 gamma 0.001	-0.53
Iterated QRF ntree 1500	-0.56
Nmodels SVM cost 5 gamma 0.001	-0.59
Iterated QRF ntree 500	-0.59
Nmodels SVM cost 1 gamma 0.001	-0.64
Iterated RT se 0	-0.95
Iterated RT se 0.5	-1.45
RW	-1.66

Iterated RT se 1	-1.66
Iterated RT se 1.5	-1.76

Table 1.3: All setups Utility



## 1.2 Stream 2

### 1.2.1 MAQ - Mean Absolute Quantile Deviation

Figure 1.4 shows the results using the MAQ error measure for all different setups.

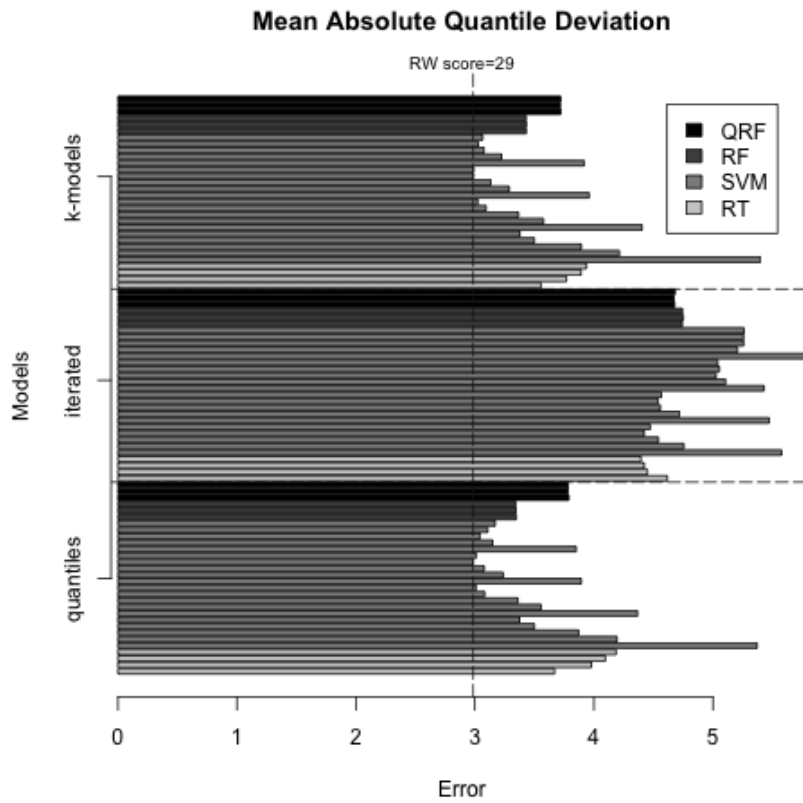


Figure 1.4: Stream 2

Table 1.4 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile SVM cost 50 gamma 0.05	2.99	2.97	2.98
Nmodels SVM cost 50 gamma 0.05	3.14	2.84	2.99
Nmodels SVM cost 100 gamma 0.05	3.11	2.87	2.99
Quantile SVM cost 100 gamma 0.01	3	3.01	3.01
Quantile SVM cost 100 gamma 0.05	3.01	3.01	3.01

Nmodels SVM cost 100 gamma 0.01	3.11	2.94	3.02
Nmodels SVM cost 50 gamma 0.1	3.12	2.93	3.03
Quantile SVM cost 10 gamma 0.1	3.03	3.06	3.04
Nmodels SVM cost 100 gamma 0.1	3.14	2.99	3.07
Nmodels SVM cost 10 gamma 0.1	3.19	2.96	3.08
Quantile SVM cost 10 gamma 0.05	3.09	3.06	3.08
Quantile SVM cost 50 gamma 0.01	3.08	3.08	3.08
Nmodels SVM cost 50 gamma 0.01	3.21	2.98	3.09
Quantile SVM cost 50 gamma 0.1	3.09	3.13	3.11
Nmodels SVM cost 10 gamma 0.05	3.27	3	3.13
Quantile SVM cost 5 gamma 0.1	3.15	3.15	3.15
Quantile SVM cost 100 gamma 0.1	3.17	3.17	3.17
Nmodels SVM cost 5 gamma 0.1	3.34	3.11	3.22
Quantile SVM cost 5 gamma 0.05	3.23	3.24	3.24
Nmodels SVM cost 5 gamma 0.05	3.4	3.18	3.29
Quantile RF ntree 1500	3.29	3.4	3.34
Quantile RF ntree 1000	3.29	3.4	3.35
Quantile RF ntree 500	3.29	3.4	3.35
Quantile SVM cost 10 gamma 0.01	3.36	3.36	3.36
Nmodels SVM cost 10 gamma 0.01	3.54	3.19	3.37
Quantile SVM cost 100 gamma 0.001	3.43	3.32	3.37
Nmodels SVM cost 100 gamma 0.001	3.67	3.09	3.38
Nmodels RF ntree 1500	3.48	3.38	3.43
Nmodels RF ntree 500	3.47	3.39	3.43
Nmodels RF ntree 1000	3.48	3.38	3.43
Nmodels SVM cost 50 gamma 0.001	3.8	3.2	3.5
Quantile SVM cost 50 gamma 0.001	3.56	3.44	3.5
Nmodels RT se 0	3.47	3.64	3.55
Quantile SVM cost 5 gamma 0.01	3.56	3.55	3.56
Nmodels SVM cost 5 gamma 0.01	3.75	3.4	3.58
Quantile RT se 0	3.67	3.67	3.67
Nmodels QRF ntree 1000	3.52	3.91	3.72
Nmodels QRF ntree 1500	3.52	3.92	3.72
Nmodels QRF ntree 500	3.53	3.91	3.72
Nmodels RT se 0.5	3.71	3.83	3.77
Quantile QRF ntree 1500	3.67	3.9	3.78
Quantile QRF ntree 1000	3.66	3.9	3.78
Quantile QRF ntree 500	3.67	3.91	3.79
Quantile SVM cost 1 gamma 0.1	3.83	3.87	3.85
Quantile SVM cost 10 gamma 0.001	3.88	3.86	3.87
Nmodels RT se 1	3.85	3.94	3.89

Quantile SVM cost 1 gamma 0.05	3.87	3.92	3.89
Nmodels SVM cost 10 gamma 0.001	4.15	3.64	3.89
Nmodels SVM cost 1 gamma 0.1	4.07	3.77	3.92
Nmodels RT se 1.5	3.94	3.94	3.94
Nmodels SVM cost 1 gamma 0.05	4.11	3.81	3.96
Quantile RT se 0.5	3.93	4.03	3.98
Quantile RT se 1	4.02	4.17	4.1
Quantile RT se 1.5	4.14	4.23	4.19
Quantile SVM cost 5 gamma 0.001	4.14	4.24	4.19
Nmodels SVM cost 5 gamma 0.001	4.44	3.99	4.21
Quantile SVM cost 1 gamma 0.01	4.31	4.42	4.37
Iterated RT se 1.5	4.68	4.11	4.4
Nmodels SVM cost 1 gamma 0.01	4.53	4.28	4.4
Iterated RT se 1	4.69	4.16	4.42
Iterated SVM cost 50 gamma 0.001	4.52	4.32	4.42
Iterated RT se 0.5	4.7	4.2	4.45
Iterated SVM cost 100 gamma 0.001	4.56	4.38	4.47
Iterated SVM cost 50 gamma 0.01	4.66	4.42	4.54
Iterated SVM cost 10 gamma 0.001	4.69	4.39	4.54
Iterated SVM cost 10 gamma 0.01	4.65	4.47	4.56
Iterated SVM cost 100 gamma 0.01	4.68	4.45	4.57
Iterated RT se 0	4.84	4.39	4.62
Iterated QRF ntree 1000	4.63	4.71	4.67
Iterated QRF ntree 500	4.64	4.72	4.68
Iterated QRF ntree 1500	4.64	4.73	4.68
Iterated SVM cost 5 gamma 0.01	4.76	4.68	4.72
Iterated RF ntree 500	4.89	4.59	4.74
Iterated RF ntree 1500	4.89	4.6	4.74
Iterated RF ntree 1000	4.89	4.61	4.75
Iterated SVM cost 5 gamma 0.001	4.92	4.6	4.76
Iterated SVM cost 10 gamma 0.05	5.08	4.97	5.03
Iterated SVM cost 100 gamma 0.05	5.09	4.99	5.04
Iterated SVM cost 50 gamma 0.05	5.1	5.01	5.05
Iterated SVM cost 5 gamma 0.05	5.14	5.08	5.11
Iterated SVM cost 5 gamma 0.1	5.2	5.21	5.21
Iterated SVM cost 10 gamma 0.1	5.2	5.32	5.26
Iterated SVM cost 50 gamma 0.1	5.19	5.33	5.26
Iterated SVM cost 100 gamma 0.1	5.19	5.33	5.26
Quantile SVM cost 1 gamma 0.001	5.22	5.52	5.37
Nmodels SVM cost 1 gamma 0.001	5.73	5.07	5.4
Iterated SVM cost 1 gamma 0.05	5.5	5.36	5.43

Iterated SVM cost 1 gamma 0.01	5.45	5.5	5.47
Iterated SVM cost 1 gamma 0.001	5.91	5.24	5.58
Iterated SVM cost 1 gamma 0.1	5.63	6.05	5.84
RW	19.09	39.53	29.31

Table 1.4: All setups MAQ

### 1.2.2 TQE - Total Quantile Error

Figure 1.5 shows the results using the TQE error measure for all different setups.

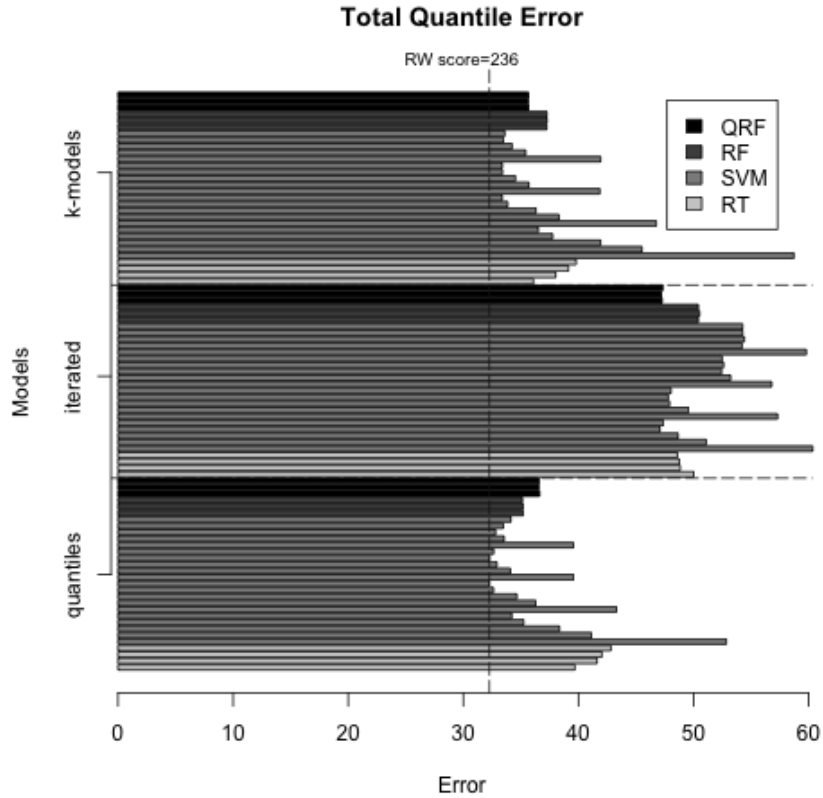


Figure 1.5: Stream 2

Table 1.5 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile SVM cost 100 gamma 0.01	16.71	15.55	32.26
Quantile SVM cost 50 gamma 0.05	17.29	14.99	32.28
Quantile SVM cost 50 gamma 0.01	16.98	15.64	32.63
Quantile SVM cost 100 gamma 0.05	17.5	15.14	32.64
Quantile SVM cost 10 gamma 0.1	17.78	15.02	32.81
Quantile SVM cost 10 gamma 0.05	17.67	15.25	32.92
Nmodels SVM cost 100 gamma 0.01	17.64	15.75	33.39

Nmodels SVM cost 100 gamma 0.05	18.19	15.2	33.4
Nmodels SVM cost 50 gamma 0.05	18.26	15.14	33.4
Nmodels SVM cost 50 gamma 0.1	18.3	15.17	33.47
Quantile SVM cost 50 gamma 0.1	17.95	15.52	33.47
Quantile SVM cost 5 gamma 0.1	18.3	15.25	33.55
Nmodels SVM cost 100 gamma 0.1	18.28	15.32	33.6
Nmodels SVM cost 50 gamma 0.01	18.03	15.83	33.86
Quantile SVM cost 5 gamma 0.05	18.35	15.74	34.09
Quantile SVM cost 100 gamma 0.1	18.34	15.8	34.13
Quantile SVM cost 100 gamma 0.001	18.29	15.92	34.21
Nmodels SVM cost 10 gamma 0.1	18.91	15.32	34.24
Nmodels SVM cost 10 gamma 0.05	18.93	15.6	34.53
Quantile SVM cost 10 gamma 0.01	18.36	16.3	34.66
Quantile RF ntree 1500	18.21	16.93	35.14
Quantile RF ntree 1000	18.23	16.96	35.18
Quantile RF ntree 500	18.26	16.94	35.2
Quantile SVM cost 50 gamma 0.001	19.04	16.21	35.24
Nmodels SVM cost 5 gamma 0.1	19.68	15.74	35.42
Nmodels QRF ntree 1000	17.93	17.72	35.65
Nmodels QRF ntree 1500	17.93	17.73	35.66
Nmodels QRF ntree 500	17.95	17.72	35.67
Nmodels SVM cost 5 gamma 0.05	19.55	16.14	35.69
Nmodels RT se 0	18.44	17.65	36.09
Quantile SVM cost 5 gamma 0.01	19.52	16.77	36.3
Nmodels SVM cost 10 gamma 0.01	19.92	16.39	36.31
Nmodels SVM cost 100 gamma 0.001	20.45	16.08	36.52
Quantile QRF ntree 1000	18.75	17.82	36.57
Quantile QRF ntree 1500	18.77	17.81	36.58
Quantile QRF ntree 500	18.75	17.89	36.63
Nmodels RF ntree 500	19.76	17.48	37.25
Nmodels RF ntree 1500	19.78	17.48	37.26
Nmodels RF ntree 1000	19.8	17.47	37.27
Nmodels SVM cost 50 gamma 0.001	21.32	16.45	37.77
Nmodels RT se 0.5	19.64	18.39	38.03
Nmodels SVM cost 5 gamma 0.01	21.23	17.09	38.31
Quantile SVM cost 10 gamma 0.001	20.67	17.68	38.35
Nmodels RT se 1	20.39	18.74	39.13
Quantile SVM cost 1 gamma 0.1	22.19	17.37	39.56
Quantile SVM cost 1 gamma 0.05	21.9	17.68	39.58
Quantile RT se 0	20.36	19.34	39.69
Nmodels RT se 1.5	20.99	18.81	39.8

Quantile SVM cost 5 gamma 0.001	21.69	19.44	41.13
Quantile RT se 0.5	21.4	20.22	41.62
Nmodels SVM cost 1 gamma 0.05	23.72	18.14	41.86
Nmodels SVM cost 10 gamma 0.001	23.62	18.3	41.92
Nmodels SVM cost 1 gamma 0.1	24.09	17.84	41.92
Quantile RT se 1	21.65	20.39	42.04
Quantile RT se 1.5	22.25	20.57	42.82
Quantile SVM cost 1 gamma 0.01	23.83	19.47	43.3
Nmodels SVM cost 5 gamma 0.001	25.24	20.29	45.52
Nmodels SVM cost 1 gamma 0.01	26.35	20.41	46.76
Iterated SVM cost 50 gamma 0.001	26.27	20.81	47.08
Iterated QRF ntree 1000	24.26	22.94	47.21
Iterated QRF ntree 500	24.31	22.96	47.27
Iterated QRF ntree 1500	24.33	23	47.33
Iterated SVM cost 100 gamma 0.001	26.26	21.12	47.38
Iterated SVM cost 50 gamma 0.01	25.99	21.8	47.8
Iterated SVM cost 10 gamma 0.01	26.79	21.13	47.92
Iterated SVM cost 100 gamma 0.01	26.07	21.98	48.05
Iterated RT se 1.5	26.82	21.78	48.59
Iterated SVM cost 10 gamma 0.001	27.43	21.23	48.66
Iterated RT se 1	26.87	21.88	48.75
Iterated RT se 0.5	26.91	21.94	48.84
Iterated SVM cost 5 gamma 0.01	27.83	21.73	49.56
Iterated RT se 0	27.44	22.59	50.03
Iterated RF ntree 500	27.14	23.27	50.42
Iterated RF ntree 1500	27.13	23.28	50.42
Iterated RF ntree 1000	27.18	23.34	50.52
Iterated SVM cost 5 gamma 0.001	28.84	22.25	51.1
Iterated SVM cost 10 gamma 0.05	29.87	22.57	52.44
Iterated SVM cost 100 gamma 0.05	29.8	22.69	52.48
Iterated SVM cost 50 gamma 0.05	29.88	22.73	52.61
Quantile SVM cost 1 gamma 0.001	28.01	24.83	52.84
Iterated SVM cost 5 gamma 0.05	30.25	22.97	53.22
Iterated SVM cost 5 gamma 0.1	31.17	23.05	54.22
Iterated SVM cost 100 gamma 0.1	30.94	23.32	54.26
Iterated SVM cost 50 gamma 0.1	30.96	23.3	54.26
Iterated SVM cost 10 gamma 0.1	31.1	23.31	54.41
Iterated SVM cost 1 gamma 0.05	33.34	23.45	56.79
Iterated SVM cost 1 gamma 0.01	32.62	24.68	57.3
Nmodels SVM cost 1 gamma 0.001	33.44	25.28	58.72
Iterated SVM cost 1 gamma 0.1	34.61	25.18	59.79

Iterated SVM cost 1 gamma 0.001	35.26	25.09	60.35
RW	122.46	113.71	236.18

Table 1.5: All setups TQE



### 1.2.3 Utility

Figure 1.6 shows the results using the Utility error measure (larger is better) for all different setups.

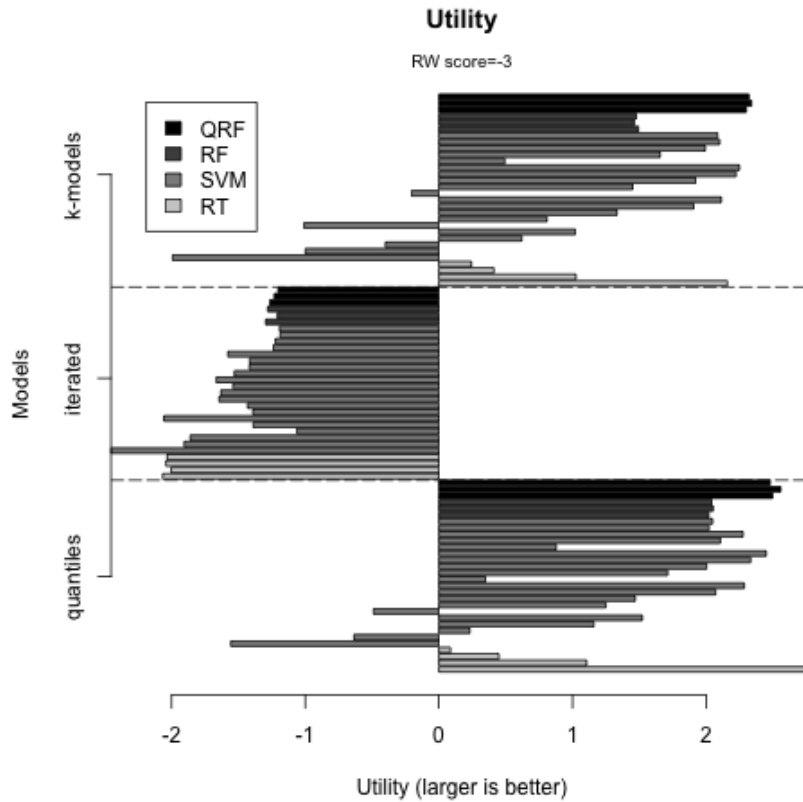


Figure 1.6: Stream 2

Table 1.6 shows all setups order by the Utility.

	utility
Quantile RT se 0	2.8
Quantile QRF ntree 1000	2.56
Quantile QRF ntree 500	2.5
Quantile QRF ntree 1500	2.48
Quantile SVM cost 100 gamma 0.05	2.45
Nmodels QRF ntree 1000	2.34
Quantile SVM cost 50 gamma 0.05	2.33

Nmodels QRF ntree 1500	2.32
Nmodels QRF ntree 500	2.3
Quantile SVM cost 100 gamma 0.01	2.28
Quantile SVM cost 10 gamma 0.1	2.28
Nmodels SVM cost 100 gamma 0.05	2.25
Nmodels SVM cost 50 gamma 0.05	2.22
Nmodels RT se 0	2.16
Nmodels SVM cost 100 gamma 0.01	2.11
Quantile SVM cost 5 gamma 0.1	2.11
Nmodels SVM cost 50 gamma 0.1	2.1
Nmodels SVM cost 100 gamma 0.1	2.08
Quantile SVM cost 50 gamma 0.01	2.07
Quantile RF ntree 1000	2.05
Quantile SVM cost 100 gamma 0.1	2.05
Quantile RF ntree 1500	2.04
Quantile SVM cost 50 gamma 0.1	2.02
Quantile RF ntree 500	2.02
Quantile SVM cost 10 gamma 0.05	2
Nmodels SVM cost 10 gamma 0.1	1.99
Nmodels SVM cost 10 gamma 0.05	1.92
Nmodels SVM cost 50 gamma 0.01	1.91
Quantile SVM cost 5 gamma 0.05	1.71
Nmodels SVM cost 5 gamma 0.1	1.66
Quantile SVM cost 100 gamma 0.001	1.52
Nmodels RF ntree 500	1.49
Nmodels RF ntree 1500	1.48
Quantile SVM cost 10 gamma 0.01	1.47
Nmodels RF ntree 1000	1.46
Nmodels SVM cost 5 gamma 0.05	1.45
Nmodels SVM cost 10 gamma 0.01	1.33
Quantile SVM cost 5 gamma 0.01	1.25
Quantile SVM cost 50 gamma 0.001	1.16
Quantile RT se 0.5	1.11
Nmodels RT se 0.5	1.03
Nmodels SVM cost 100 gamma 0.001	1.02
Quantile SVM cost 1 gamma 0.1	0.88
Nmodels SVM cost 5 gamma 0.01	0.81
Nmodels SVM cost 50 gamma 0.001	0.62
Nmodels SVM cost 1 gamma 0.1	0.49
Quantile RT se 1	0.45
Nmodels RT se 1	0.41

Quantile SVM cost 1 gamma 0.05	0.35
Nmodels RT se 1.5	0.24
Quantile SVM cost 10 gamma 0.001	0.23
Quantile RT se 1.5	0.09
Nmodels SVM cost 1 gamma 0.05	-0.2
Nmodels SVM cost 10 gamma 0.001	-0.4
Quantile SVM cost 1 gamma 0.01	-0.49
Quantile SVM cost 5 gamma 0.001	-0.64
Nmodels SVM cost 5 gamma 0.001	-1
Nmodels SVM cost 1 gamma 0.01	-1.01
Iterated SVM cost 50 gamma 0.001	-1.06
Iterated SVM cost 50 gamma 0.1	-1.19
Iterated SVM cost 100 gamma 0.1	-1.19
Iterated QRF ntree 1500	-1.2
Iterated RF ntree 1000	-1.21
Iterated SVM cost 10 gamma 0.1	-1.22
Iterated QRF ntree 1000	-1.23
Iterated SVM cost 5 gamma 0.1	-1.24
Iterated QRF ntree 500	-1.26
Iterated RF ntree 1500	-1.28
Iterated RF ntree 500	-1.3
Iterated SVM cost 100 gamma 0.001	-1.39
Iterated SVM cost 5 gamma 0.01	-1.39
Iterated SVM cost 100 gamma 0.05	-1.42
Iterated SVM cost 50 gamma 0.05	-1.42
Iterated SVM cost 10 gamma 0.01	-1.43
Iterated SVM cost 10 gamma 0.05	-1.53
Iterated SVM cost 1 gamma 0.05	-1.54
Quantile SVM cost 1 gamma 0.001	-1.56
Iterated SVM cost 1 gamma 0.1	-1.58
Iterated SVM cost 100 gamma 0.01	-1.63
Iterated SVM cost 50 gamma 0.01	-1.64
Iterated SVM cost 5 gamma 0.05	-1.67
Iterated SVM cost 10 gamma 0.001	-1.86
Iterated SVM cost 5 gamma 0.001	-1.91
Nmodels SVM cost 1 gamma 0.001	-1.99
Iterated RT se 0.5	-2
Iterated RT se 1.5	-2.03
Iterated RT se 1	-2.04
Iterated SVM cost 1 gamma 0.01	-2.06
Iterated RT se 0	-2.07

Iterated SVM cost 1 gamma 0.001	-2.45
RW	-2.7

Table 1.6: All setups Utility

## 1.3 Stream 3

### 1.3.1 MAQ - Mean Absolute Quantile Deviation

Figure 1.7 shows the results using the MAQ error measure for all different setups.

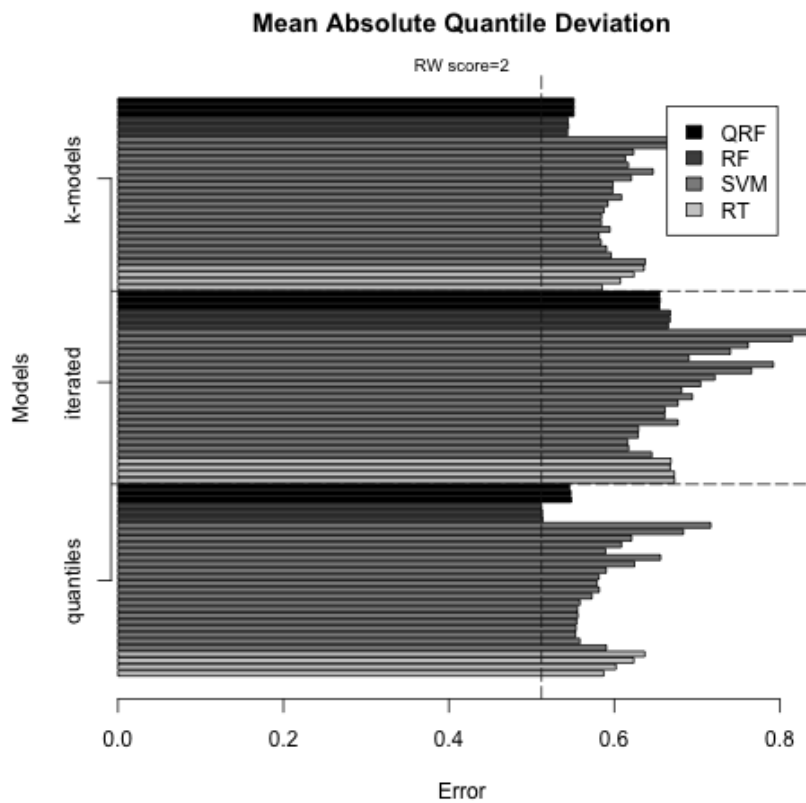


Figure 1.7: Stream 3

Table 1.7 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile RF ntree 1500	0.52	0.51	0.51
Quantile RF ntree 1000	0.52	0.51	0.51
Quantile RF ntree 500	0.52	0.51	0.51
Nmodels RF ntree 500	0.54	0.55	0.54
Nmodels RF ntree 1500	0.54	0.55	0.54

Nmodels RF ntree 1000	0.54	0.55	0.54
Quantile QRF ntree 1500	0.55	0.54	0.55
Quantile QRF ntree 1000	0.55	0.55	0.55
Quantile QRF ntree 500	0.55	0.55	0.55
Nmodels QRF ntree 500	0.56	0.54	0.55
Nmodels QRF ntree 1500	0.56	0.54	0.55
Nmodels QRF ntree 1000	0.56	0.54	0.55
Quantile SVM cost 10 gamma 0.001	0.55	0.55	0.55
Quantile SVM cost 50 gamma 0.001	0.55	0.55	0.55
Quantile SVM cost 100 gamma 0.001	0.55	0.56	0.55
Quantile SVM cost 5 gamma 0.01	0.55	0.56	0.56
Quantile SVM cost 1 gamma 0.01	0.55	0.56	0.56
Quantile SVM cost 5 gamma 0.001	0.56	0.56	0.56
Quantile SVM cost 10 gamma 0.01	0.55	0.56	0.56
Quantile SVM cost 50 gamma 0.01	0.57	0.58	0.57
Quantile SVM cost 1 gamma 0.05	0.58	0.58	0.58
Quantile SVM cost 5 gamma 0.05	0.57	0.59	0.58
Nmodels SVM cost 100 gamma 0.001	0.59	0.57	0.58
Quantile SVM cost 100 gamma 0.01	0.57	0.59	0.58
Nmodels SVM cost 50 gamma 0.001	0.6	0.57	0.58
Nmodels SVM cost 5 gamma 0.01	0.59	0.58	0.58
Nmodels SVM cost 10 gamma 0.01	0.59	0.58	0.58
Nmodels RT se 0	0.58	0.59	0.59
Quantile RT se 0	0.6	0.57	0.59
Nmodels SVM cost 50 gamma 0.01	0.59	0.59	0.59
Quantile SVM cost 1 gamma 0.1	0.58	0.59	0.59
Quantile SVM cost 10 gamma 0.05	0.58	0.6	0.59
Quantile SVM cost 1 gamma 0.001	0.59	0.59	0.59
Nmodels SVM cost 10 gamma 0.001	0.6	0.58	0.59
Nmodels SVM cost 100 gamma 0.01	0.59	0.59	0.59
Nmodels SVM cost 1 gamma 0.01	0.61	0.58	0.59
Nmodels SVM cost 5 gamma 0.001	0.61	0.59	0.6
Nmodels SVM cost 5 gamma 0.05	0.59	0.61	0.6
Nmodels SVM cost 10 gamma 0.05	0.59	0.61	0.6
Quantile RT se 0.5	0.61	0.59	0.6
Nmodels RT se 0.5	0.62	0.6	0.61
Quantile SVM cost 5 gamma 0.1	0.61	0.61	0.61
Nmodels SVM cost 1 gamma 0.05	0.6	0.61	0.61
Nmodels SVM cost 5 gamma 0.1	0.6	0.62	0.61
Iterated SVM cost 10 gamma 0.001	0.64	0.6	0.62
Nmodels SVM cost 1 gamma 0.1	0.61	0.62	0.62

Iterated SVM cost 5 gamma 0.001	0.64	0.59	0.62
Nmodels SVM cost 50 gamma 0.05	0.61	0.63	0.62
Quantile SVM cost 10 gamma 0.1	0.62	0.62	0.62
Nmodels SVM cost 10 gamma 0.1	0.61	0.63	0.62
Quantile RT se 1	0.63	0.62	0.62
Nmodels RT se 1	0.64	0.61	0.62
Quantile SVM cost 50 gamma 0.05	0.62	0.63	0.62
Iterated SVM cost 50 gamma 0.001	0.64	0.62	0.63
Iterated SVM cost 100 gamma 0.001	0.64	0.62	0.63
Nmodels RT se 1.5	0.65	0.62	0.64
Quantile RT se 1.5	0.65	0.63	0.64
Nmodels SVM cost 1 gamma 0.001	0.65	0.62	0.64
Iterated SVM cost 1 gamma 0.001	0.68	0.62	0.65
Nmodels SVM cost 100 gamma 0.05	0.64	0.66	0.65
Iterated QRF ntree 1500	0.65	0.65	0.65
Iterated QRF ntree 500	0.65	0.66	0.65
Iterated QRF ntree 1000	0.66	0.66	0.66
Quantile SVM cost 100 gamma 0.05	0.66	0.65	0.66
Iterated SVM cost 5 gamma 0.01	0.66	0.66	0.66
Iterated SVM cost 10 gamma 0.01	0.66	0.67	0.66
Iterated RF ntree 500	0.66	0.67	0.67
Iterated RF ntree 1000	0.66	0.67	0.67
Iterated RT se 1	0.65	0.69	0.67
Iterated RF ntree 1500	0.66	0.67	0.67
Iterated RT se 1.5	0.65	0.68	0.67
Iterated RT se 0.5	0.65	0.7	0.67
Iterated RT se 0	0.65	0.7	0.67
Iterated SVM cost 50 gamma 0.01	0.67	0.69	0.68
Iterated SVM cost 1 gamma 0.01	0.68	0.67	0.68
Nmodels SVM cost 50 gamma 0.1	0.67	0.69	0.68
Iterated SVM cost 1 gamma 0.05	0.67	0.69	0.68
Quantile SVM cost 50 gamma 0.1	0.68	0.68	0.68
Iterated SVM cost 1 gamma 0.1	0.69	0.69	0.69
Iterated SVM cost 100 gamma 0.01	0.67	0.72	0.69
Iterated SVM cost 5 gamma 0.05	0.68	0.73	0.7
Nmodels SVM cost 100 gamma 0.1	0.71	0.71	0.71
Quantile SVM cost 100 gamma 0.1	0.72	0.72	0.72
Iterated SVM cost 10 gamma 0.05	0.7	0.74	0.72
Iterated SVM cost 5 gamma 0.1	0.73	0.75	0.74
Iterated SVM cost 10 gamma 0.1	0.75	0.77	0.76
Iterated SVM cost 50 gamma 0.05	0.75	0.78	0.77

Iterated SVM cost 100 gamma 0.05	0.77	0.81	0.79
Iterated SVM cost 50 gamma 0.1	0.79	0.84	0.81
Iterated SVM cost 100 gamma 0.1	0.82	0.86	0.84
RW	1.24	2.31	1.78

Table 1.7: All setups MAQ



### 1.3.2 TQE - Total Quantile Error

Figure 1.8 shows the results using the TQE error measure for all different setups.

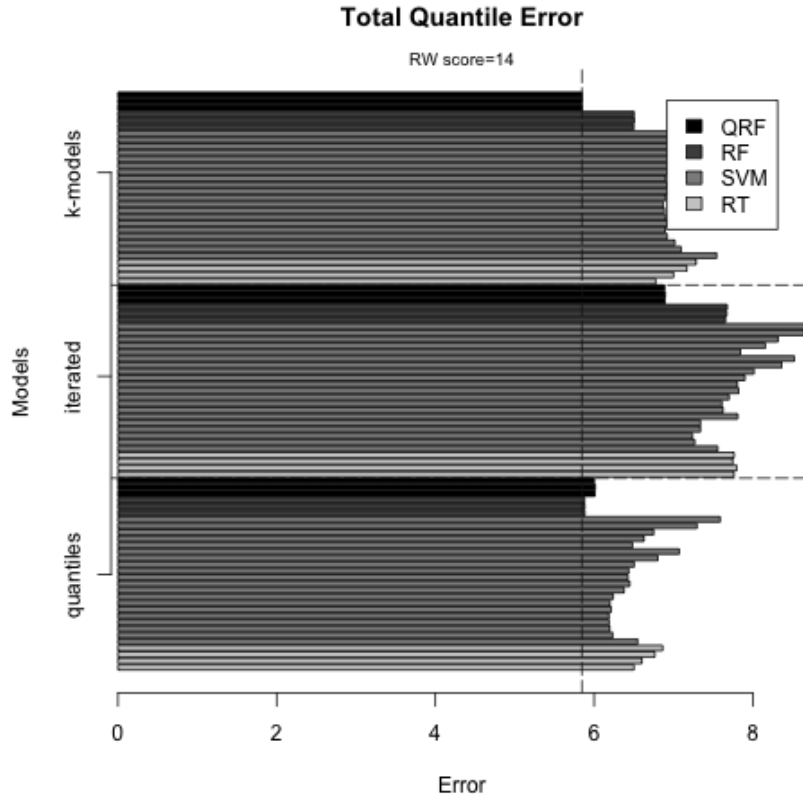


Figure 1.8: Stream 3

Table 1.8 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Nmodels QRF ntree 1500	2.87	2.98	5.85
Nmodels QRF ntree 500	2.87	2.98	5.85
Nmodels QRF ntree 1000	2.87	2.98	5.85
Quantile RF ntree 1500	2.85	3.03	5.88
Quantile RF ntree 1000	2.85	3.03	5.88
Quantile RF ntree 500	2.86	3.03	5.88
Quantile QRF ntree 1500	2.92	3.09	6

Quantile QRF ntree 500	2.92	3.09	6.01
Quantile QRF ntree 1000	2.92	3.1	6.01
Quantile SVM cost 100 gamma 0.001	3.09	3.1	6.19
Quantile SVM cost 50 gamma 0.001	3.1	3.09	6.19
Quantile SVM cost 10 gamma 0.001	3.08	3.12	6.2
Quantile SVM cost 5 gamma 0.01	3.05	3.15	6.2
Quantile SVM cost 1 gamma 0.01	3.04	3.18	6.22
Quantile SVM cost 5 gamma 0.001	3.08	3.16	6.23
Quantile SVM cost 10 gamma 0.01	3.07	3.17	6.24
Quantile SVM cost 50 gamma 0.01	3.13	3.25	6.38
Quantile SVM cost 1 gamma 0.05	3.14	3.29	6.43
Quantile SVM cost 5 gamma 0.05	3.1	3.33	6.44
Quantile SVM cost 100 gamma 0.01	3.15	3.29	6.45
Quantile SVM cost 1 gamma 0.1	3.11	3.37	6.48
Nmodels RF ntree 500	3.15	3.35	6.5
Quantile RT se 0	3.16	3.34	6.5
Nmodels RF ntree 1500	3.15	3.35	6.5
Quantile SVM cost 10 gamma 0.05	3.12	3.39	6.5
Nmodels RF ntree 1000	3.15	3.35	6.51
Quantile SVM cost 1 gamma 0.001	3.16	3.38	6.55
Quantile RT se 0.5	3.19	3.42	6.6
Quantile SVM cost 5 gamma 0.1	3.14	3.48	6.63
Quantile SVM cost 10 gamma 0.1	3.2	3.55	6.75
Quantile RT se 1	3.26	3.51	6.77
Nmodels RT se 0	3.25	3.52	6.78
Quantile SVM cost 50 gamma 0.05	3.22	3.58	6.8
Quantile RT se 1.5	3.32	3.54	6.86
Nmodels SVM cost 50 gamma 0.01	3.41	3.47	6.87
Nmodels SVM cost 10 gamma 0.01	3.42	3.46	6.89
Iterated QRF ntree 1500	3.29	3.6	6.89
Nmodels SVM cost 100 gamma 0.001	3.5	3.39	6.89
Iterated QRF ntree 500	3.29	3.61	6.9
Iterated QRF ntree 1000	3.29	3.6	6.9
Nmodels SVM cost 10 gamma 0.05	3.3	3.6	6.9
Nmodels SVM cost 100 gamma 0.01	3.41	3.49	6.9
Nmodels SVM cost 5 gamma 0.01	3.44	3.47	6.9
Nmodels SVM cost 5 gamma 0.05	3.34	3.58	6.92
Nmodels SVM cost 50 gamma 0.001	3.51	3.41	6.92
Nmodels SVM cost 5 gamma 0.1	3.3	3.7	7
Nmodels RT se 0.5	3.39	3.61	7
Nmodels SVM cost 10 gamma 0.001	3.54	3.48	7.02

Nmodels SVM cost 50 gamma 0.05	3.33	3.7	7.02
Nmodels SVM cost 1 gamma 0.01	3.51	3.53	7.04
Nmodels SVM cost 10 gamma 0.1	3.32	3.73	7.05
Quantile SVM cost 100 gamma 0.05	3.36	3.71	7.07
Nmodels SVM cost 1 gamma 0.05	3.46	3.63	7.08
Nmodels SVM cost 5 gamma 0.001	3.54	3.55	7.1
Nmodels SVM cost 1 gamma 0.1	3.39	3.71	7.1
Nmodels RT se 1	3.49	3.68	7.17
Nmodels SVM cost 100 gamma 0.05	3.4	3.79	7.19
Iterated SVM cost 10 gamma 0.001	3.7	3.54	7.24
Iterated SVM cost 5 gamma 0.001	3.68	3.59	7.27
Nmodels RT se 1.5	3.54	3.75	7.29
Quantile SVM cost 50 gamma 0.1	3.49	3.81	7.3
Iterated SVM cost 50 gamma 0.001	3.67	3.67	7.34
Iterated SVM cost 100 gamma 0.001	3.65	3.69	7.34
Nmodels SVM cost 50 gamma 0.1	3.52	3.89	7.4
Nmodels SVM cost 1 gamma 0.001	3.71	3.83	7.54
Iterated SVM cost 1 gamma 0.001	3.81	3.75	7.56
Nmodels SVM cost 100 gamma 0.1	3.65	3.91	7.57
Quantile SVM cost 100 gamma 0.1	3.65	3.94	7.59
Iterated SVM cost 10 gamma 0.01	3.67	3.94	7.61
Iterated SVM cost 5 gamma 0.01	3.68	3.94	7.62
Iterated RF ntree 500	3.66	4	7.65
Iterated RF ntree 1000	3.66	4.01	7.67
Iterated RF ntree 1500	3.66	4.02	7.68
Iterated SVM cost 50 gamma 0.01	3.67	4.03	7.7
Iterated RT se 1	3.69	4.06	7.75
Iterated RT se 0	3.7	4.07	7.76
Iterated RT se 1.5	3.71	4.05	7.76
Iterated RT se 0.5	3.71	4.08	7.8
Iterated SVM cost 1 gamma 0.05	3.76	4.05	7.81
Iterated SVM cost 1 gamma 0.01	3.79	4.02	7.81
Iterated SVM cost 100 gamma 0.01	3.67	4.15	7.82
Iterated SVM cost 1 gamma 0.1	3.77	4.07	7.84
Iterated SVM cost 5 gamma 0.05	3.68	4.22	7.9
Iterated SVM cost 10 gamma 0.05	3.72	4.29	8.02
Iterated SVM cost 5 gamma 0.1	3.83	4.33	8.16
Iterated SVM cost 10 gamma 0.1	3.88	4.44	8.32
Iterated SVM cost 50 gamma 0.05	3.86	4.51	8.37
Iterated SVM cost 100 gamma 0.05	3.94	4.59	8.52
Iterated SVM cost 50 gamma 0.1	4.06	4.59	8.65

Iterated SVM cost 100 gamma 0.1	4.13	4.63	8.75
RW	5.44	8.84	14.29

Table 1.8: All setups TQE

### 1.3.3 Utility

Figure 1.9 shows the results using the Utility error measure (larger is better) for all different setups.

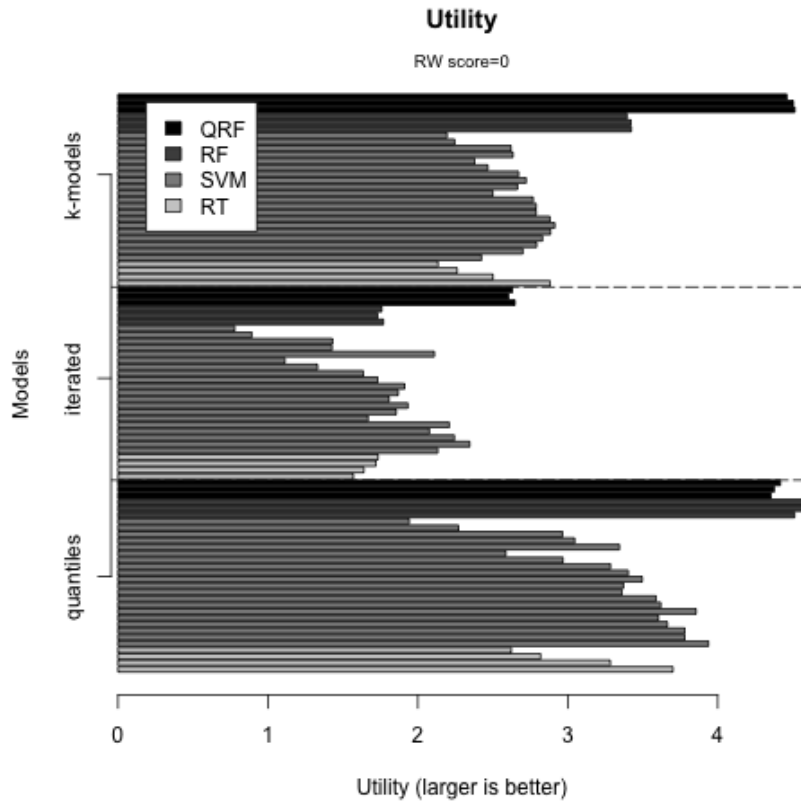


Figure 1.9: Stream 3

Table 1.9 shows all setups order by the Utility.

	utility
Quantile RF ntree 1500	4.63
Quantile RF ntree 1000	4.61
Nmodels QRF ntree 500	4.51
Quantile RF ntree 500	4.51
Nmodels QRF ntree 1000	4.5
Nmodels QRF ntree 1500	4.46
Quantile QRF ntree 1500	4.42

Quantile QRF ntree 1000	4.38
Quantile QRF ntree 500	4.36
Quantile SVM cost 1 gamma 0.001	3.94
Quantile SVM cost 1 gamma 0.01	3.86
Quantile SVM cost 10 gamma 0.001	3.78
Quantile SVM cost 5 gamma 0.001	3.78
Quantile RT se 0	3.7
Quantile SVM cost 50 gamma 0.001	3.66
Quantile SVM cost 5 gamma 0.01	3.62
Quantile SVM cost 100 gamma 0.001	3.6
Quantile SVM cost 10 gamma 0.01	3.59
Quantile SVM cost 1 gamma 0.05	3.5
Nmodels RF ntree 500	3.42
Nmodels RF ntree 1000	3.42
Quantile SVM cost 5 gamma 0.05	3.4
Nmodels RF ntree 1500	3.39
Quantile SVM cost 100 gamma 0.01	3.37
Quantile SVM cost 50 gamma 0.01	3.36
Quantile SVM cost 1 gamma 0.1	3.34
Quantile SVM cost 10 gamma 0.05	3.28
Quantile RT se 0.5	3.28
Quantile SVM cost 5 gamma 0.1	3.05
Quantile SVM cost 50 gamma 0.05	2.97
Quantile SVM cost 10 gamma 0.1	2.96
Nmodels SVM cost 1 gamma 0.01	2.91
Nmodels SVM cost 100 gamma 0.001	2.88
Nmodels RT se 0	2.88
Nmodels SVM cost 5 gamma 0.01	2.88
Nmodels SVM cost 50 gamma 0.001	2.83
Quantile RT se 1	2.82
Nmodels SVM cost 10 gamma 0.001	2.79
Nmodels SVM cost 10 gamma 0.01	2.79
Nmodels SVM cost 50 gamma 0.01	2.79
Nmodels SVM cost 100 gamma 0.01	2.77
Nmodels SVM cost 10 gamma 0.05	2.72
Nmodels SVM cost 5 gamma 0.001	2.7
Nmodels SVM cost 50 gamma 0.05	2.67
Nmodels SVM cost 5 gamma 0.05	2.66
Iterated QRF ntree 500	2.65
Nmodels SVM cost 5 gamma 0.1	2.63
Iterated QRF ntree 1500	2.63

Quantile RT se 1.5	2.62
Nmodels SVM cost 10 gamma 0.1	2.62
Iterated QRF ntree 1000	2.6
Quantile SVM cost 100 gamma 0.05	2.59
Nmodels RT se 0.5	2.5
Nmodels SVM cost 1 gamma 0.05	2.5
Nmodels SVM cost 100 gamma 0.05	2.47
Nmodels SVM cost 1 gamma 0.001	2.42
Nmodels SVM cost 1 gamma 0.1	2.38
Iterated SVM cost 5 gamma 0.001	2.35
Quantile SVM cost 50 gamma 0.1	2.27
Nmodels RT se 1	2.26
Nmodels SVM cost 50 gamma 0.1	2.25
Iterated SVM cost 10 gamma 0.001	2.24
Iterated SVM cost 100 gamma 0.001	2.21
Nmodels SVM cost 100 gamma 0.1	2.19
Nmodels RT se 1.5	2.13
Iterated SVM cost 1 gamma 0.001	2.13
Iterated SVM cost 1 gamma 0.1	2.11
Iterated SVM cost 50 gamma 0.001	2.08
Quantile SVM cost 100 gamma 0.1	1.94
Iterated SVM cost 10 gamma 0.01	1.93
Iterated SVM cost 1 gamma 0.05	1.91
Iterated SVM cost 100 gamma 0.01	1.87
Iterated SVM cost 5 gamma 0.01	1.86
Iterated SVM cost 50 gamma 0.01	1.81
Iterated RF ntree 500	1.77
Iterated RF ntree 1500	1.76
Iterated RT se 1.5	1.73
Iterated SVM cost 5 gamma 0.05	1.73
Iterated RF ntree 1000	1.73
Iterated RT se 1	1.72
Iterated SVM cost 1 gamma 0.01	1.67
Iterated RT se 0.5	1.64
Iterated SVM cost 10 gamma 0.05	1.64
Iterated RT se 0	1.57
Iterated SVM cost 10 gamma 0.1	1.43
Iterated SVM cost 5 gamma 0.1	1.43
Iterated SVM cost 50 gamma 0.05	1.33
Iterated SVM cost 100 gamma 0.05	1.11
Iterated SVM cost 50 gamma 0.1	0.89

Iterated SVM cost 100 gamma 0.1	0.78
RW	0.43

Table 1.9: All setups Utility



## 1.4 Stream 4

### 1.4.1 MAQ - Mean Absolute Quantile Deviation

Figure 1.10 shows the results using the MAQ error measure for all different setups.

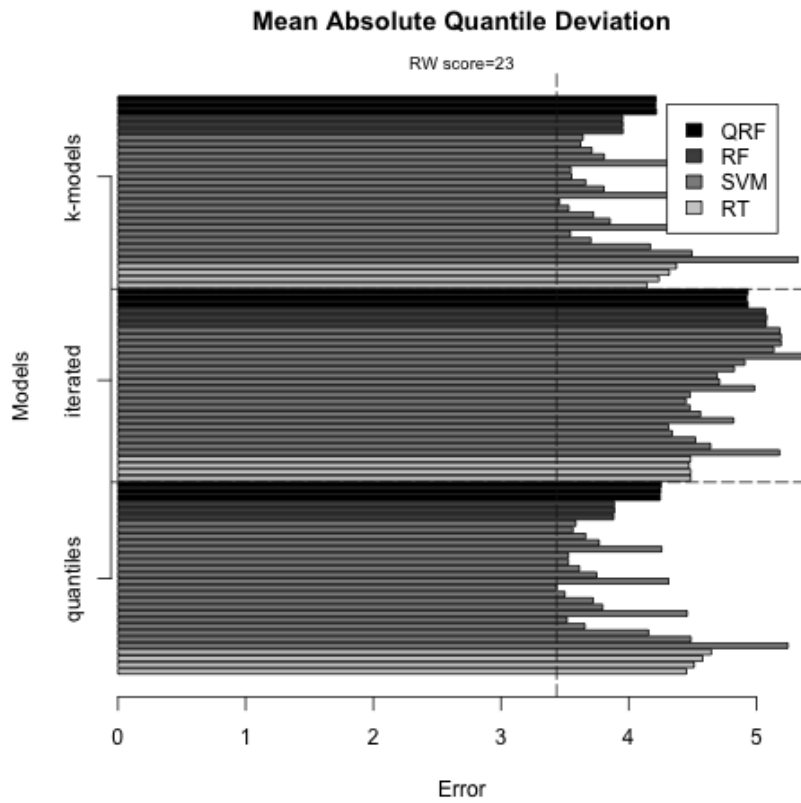


Figure 1.10: Stream 4

Table 1.10 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile SVM cost 100 gamma 0.01	3.47	3.4	3.44
Nmodels SVM cost 100 gamma 0.01	3.54	3.38	3.46
Quantile SVM cost 50 gamma 0.01	3.53	3.47	3.5
Quantile SVM cost 100 gamma 0.001	3.55	3.48	3.52
Quantile SVM cost 50 gamma 0.05	3.59	3.47	3.53

Quantile SVM cost 100 gamma 0.05	3.58	3.47	3.53
Nmodels SVM cost 50 gamma 0.01	3.65	3.41	3.53
Nmodels SVM cost 100 gamma 0.001	3.57	3.52	3.54
Nmodels SVM cost 100 gamma 0.05	3.63	3.47	3.55
Nmodels SVM cost 50 gamma 0.05	3.63	3.47	3.55
Quantile SVM cost 50 gamma 0.1	3.62	3.51	3.56
Quantile SVM cost 100 gamma 0.1	3.6	3.57	3.59
Quantile SVM cost 10 gamma 0.05	3.63	3.6	3.61
Nmodels SVM cost 50 gamma 0.1	3.71	3.54	3.62
Nmodels SVM cost 100 gamma 0.1	3.69	3.6	3.64
Quantile SVM cost 50 gamma 0.001	3.66	3.65	3.66
Quantile SVM cost 10 gamma 0.1	3.71	3.62	3.66
Nmodels SVM cost 10 gamma 0.05	3.8	3.52	3.66
Nmodels SVM cost 50 gamma 0.001	3.72	3.69	3.7
Nmodels SVM cost 10 gamma 0.1	3.83	3.59	3.71
Quantile SVM cost 10 gamma 0.01	3.75	3.69	3.72
Nmodels SVM cost 10 gamma 0.01	3.85	3.6	3.72
Quantile SVM cost 5 gamma 0.05	3.77	3.73	3.75
Quantile SVM cost 5 gamma 0.1	3.82	3.72	3.77
Quantile SVM cost 5 gamma 0.01	3.81	3.79	3.8
Nmodels SVM cost 5 gamma 0.05	3.97	3.64	3.81
Nmodels SVM cost 5 gamma 0.1	3.96	3.66	3.81
Nmodels SVM cost 5 gamma 0.01	3.95	3.76	3.85
Quantile RF ntree 500	3.9	3.87	3.88
Quantile RF ntree 1500	3.9	3.87	3.89
Quantile RF ntree 1000	3.91	3.87	3.89
Nmodels RF ntree 1500	4.08	3.83	3.95
Nmodels RF ntree 1000	4.08	3.83	3.96
Nmodels RF ntree 500	4.08	3.83	3.96
Nmodels RT se 0	4.15	4.14	4.14
Quantile SVM cost 10 gamma 0.001	4.11	4.2	4.16
Nmodels SVM cost 10 gamma 0.001	4.18	4.16	4.17
Nmodels QRF ntree 1000	4.12	4.3	4.21
Nmodels QRF ntree 1500	4.12	4.3	4.21
Nmodels QRF ntree 500	4.13	4.3	4.22
Nmodels RT se 0.5	4.25	4.22	4.24
Quantile QRF ntree 500	4.19	4.3	4.25
Quantile QRF ntree 1000	4.18	4.32	4.25
Quantile QRF ntree 1500	4.18	4.33	4.25
Quantile SVM cost 1 gamma 0.1	4.31	4.21	4.26
Nmodels SVM cost 1 gamma 0.1	4.53	4.08	4.3

Iterated SVM cost 100 gamma 0.001	4.37	4.26	4.31
Quantile SVM cost 1 gamma 0.05	4.37	4.26	4.31
Nmodels RT se 1	4.33	4.31	4.32
Iterated SVM cost 50 gamma 0.001	4.43	4.25	4.34
Nmodels SVM cost 1 gamma 0.05	4.59	4.14	4.37
Nmodels RT se 1.5	4.4	4.35	4.37
Iterated SVM cost 50 gamma 0.01	4.56	4.33	4.45
Quantile RT se 0	4.31	4.6	4.45
Quantile SVM cost 1 gamma 0.01	4.45	4.47	4.46
Iterated RT se 1	4.54	4.41	4.47
Nmodels SVM cost 1 gamma 0.01	4.57	4.38	4.47
Iterated SVM cost 10 gamma 0.01	4.54	4.41	4.48
Iterated SVM cost 100 gamma 0.01	4.59	4.37	4.48
Iterated RT se 1.5	4.56	4.41	4.48
Iterated RT se 0	4.54	4.43	4.49
Iterated RT se 0.5	4.55	4.42	4.49
Quantile SVM cost 5 gamma 0.001	4.47	4.51	4.49
Nmodels SVM cost 5 gamma 0.001	4.55	4.44	4.5
Quantile RT se 0.5	4.37	4.65	4.51
Iterated SVM cost 10 gamma 0.001	4.63	4.41	4.52
Iterated SVM cost 5 gamma 0.01	4.61	4.52	4.56
Quantile RT se 1	4.55	4.61	4.58
Iterated SVM cost 5 gamma 0.001	4.77	4.51	4.64
Quantile RT se 1.5	4.63	4.67	4.65
Iterated SVM cost 10 gamma 0.05	4.77	4.62	4.69
Iterated SVM cost 5 gamma 0.05	4.77	4.65	4.71
Iterated SVM cost 1 gamma 0.01	4.88	4.77	4.82
Iterated SVM cost 50 gamma 0.05	4.91	4.74	4.83
Iterated SVM cost 100 gamma 0.05	5.02	4.8	4.91
Iterated QRF ntree 1000	4.9	4.95	4.93
Iterated QRF ntree 1500	4.91	4.96	4.93
Iterated QRF ntree 500	4.91	4.96	4.93
Iterated SVM cost 1 gamma 0.05	5.05	4.92	4.99
Iterated RF ntree 1500	5.15	4.99	5.07
Iterated RF ntree 500	5.15	5	5.08
Iterated RF ntree 1000	5.15	5.01	5.08
Iterated SVM cost 5 gamma 0.1	5.24	5.03	5.14
Iterated SVM cost 1 gamma 0.001	5.38	4.98	5.18
Iterated SVM cost 100 gamma 0.1	5.33	5.04	5.18
Iterated SVM cost 10 gamma 0.1	5.32	5.06	5.19
Iterated SVM cost 50 gamma 0.1	5.33	5.06	5.19

Quantile SVM cost 1 gamma 0.001	5.2	5.3	5.25
Nmodels SVM cost 1 gamma 0.001	5.46	5.19	5.33
Iterated SVM cost 1 gamma 0.1	5.66	5.22	5.44
RW	19.05	26.76	22.91

Table 1.10: All setups MAQ

### 1.4.2 TQE - Total Quantile Error

Figure 1.11 shows the results using the TQE error measure for all different setups.

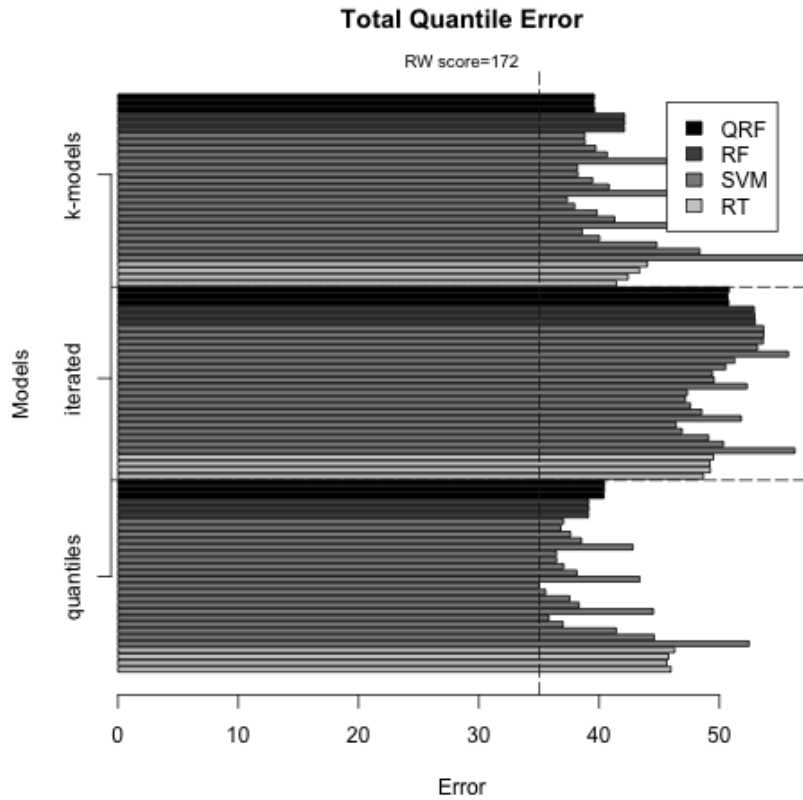


Figure 1.11: Stream 4

Table 1.11 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile SVM cost 100 gamma 0.01	17.57	17.45	35.02
Quantile SVM cost 50 gamma 0.01	17.83	17.72	35.55
Quantile SVM cost 100 gamma 0.001	18.32	17.5	35.82
Quantile SVM cost 100 gamma 0.05	18.67	17.78	36.45
Quantile SVM cost 50 gamma 0.05	18.74	17.73	36.46
Quantile SVM cost 50 gamma 0.1	19.07	17.75	36.82
Quantile SVM cost 50 gamma 0.001	19.01	17.99	37

Quantile SVM cost 100 gamma 0.1	19.01	18.03	37.04
Quantile SVM cost 10 gamma 0.05	18.91	18.14	37.05
Nmodels SVM cost 100 gamma 0.01	18.96	18.38	37.34
Quantile SVM cost 10 gamma 0.01	18.92	18.62	37.55
Quantile SVM cost 10 gamma 0.1	19.48	18.14	37.62
Nmodels SVM cost 50 gamma 0.01	19.46	18.5	37.96
Quantile SVM cost 5 gamma 0.05	19.43	18.72	38.15
Nmodels SVM cost 100 gamma 0.05	19.63	18.57	38.2
Nmodels SVM cost 50 gamma 0.05	19.71	18.53	38.24
Quantile SVM cost 5 gamma 0.01	19.64	18.69	38.33
Quantile SVM cost 5 gamma 0.1	19.97	18.56	38.53
Nmodels SVM cost 100 gamma 0.001	19.76	18.82	38.58
Nmodels SVM cost 100 gamma 0.1	19.95	18.85	38.8
Nmodels SVM cost 50 gamma 0.1	20.11	18.71	38.82
Quantile RF ntree 500	20.14	18.96	39.11
Quantile RF ntree 1500	20.17	18.96	39.13
Quantile RF ntree 1000	20.19	18.94	39.13
Nmodels SVM cost 10 gamma 0.05	20.54	18.91	39.45
Nmodels QRF ntree 1000	19.97	19.6	39.56
Nmodels QRF ntree 1500	19.98	19.61	39.59
Nmodels QRF ntree 500	19.99	19.63	39.61
Nmodels SVM cost 10 gamma 0.1	20.73	18.99	39.73
Nmodels SVM cost 10 gamma 0.01	20.68	19.14	39.82
Nmodels SVM cost 50 gamma 0.001	20.64	19.39	40.03
Quantile QRF ntree 500	20.54	19.86	40.4
Quantile QRF ntree 1000	20.49	19.94	40.43
Quantile QRF ntree 1500	20.49	19.95	40.44
Nmodels SVM cost 5 gamma 0.1	21.31	19.35	40.66
Nmodels SVM cost 5 gamma 0.05	21.35	19.46	40.81
Nmodels SVM cost 5 gamma 0.01	21.58	19.72	41.29
Quantile SVM cost 10 gamma 0.001	21.72	19.69	41.42
Nmodels RT se 0	21.33	20.1	41.42
Nmodels RF ntree 500	22.32	19.77	42.09
Nmodels RF ntree 1500	22.35	19.77	42.12
Nmodels RF ntree 1000	22.34	19.77	42.12
Nmodels RT se 0.5	21.96	20.45	42.41
Quantile SVM cost 1 gamma 0.1	22.14	20.66	42.81
Nmodels RT se 1	22.5	20.85	43.35
Quantile SVM cost 1 gamma 0.05	22.26	21.11	43.37
Nmodels RT se 1.5	22.93	21.09	44.01
Quantile SVM cost 1 gamma 0.01	23.66	20.85	44.51

Quantile SVM cost 5 gamma 0.001	23.86	20.72	44.58
Nmodels SVM cost 10 gamma 0.001	23.77	21.02	44.78
Nmodels SVM cost 1 gamma 0.1	24.25	21.35	45.61
Quantile RT se 0.5	23.07	22.56	45.63
Quantile RT se 1	23.77	22.01	45.77
Quantile RT se 0	23.23	22.73	45.96
Quantile RT se 1.5	24.07	22.21	46.28
Iterated SVM cost 100 gamma 0.001	24.35	22.04	46.4
Nmodels SVM cost 1 gamma 0.05	24.58	21.88	46.46
Iterated SVM cost 50 gamma 0.001	24.69	22.2	46.89
Iterated SVM cost 50 gamma 0.01	24.2	22.97	47.17
Iterated SVM cost 100 gamma 0.01	24.32	23.02	47.34
Iterated SVM cost 10 gamma 0.01	24.53	23.05	47.58
Nmodels SVM cost 1 gamma 0.01	26.02	21.85	47.87
Nmodels SVM cost 5 gamma 0.001	26.29	22.08	48.37
Iterated SVM cost 5 gamma 0.01	25.08	23.46	48.54
Iterated RT se 0	25.02	23.65	48.66
Iterated SVM cost 10 gamma 0.001	26.33	22.76	49.09
Iterated RT se 1	25.39	23.83	49.22
Iterated RT se 0.5	25.28	23.95	49.24
Iterated SVM cost 10 gamma 0.05	25.25	24.17	49.42
Iterated RT se 1.5	25.56	23.93	49.5
Iterated SVM cost 5 gamma 0.05	25.27	24.28	49.55
Iterated SVM cost 5 gamma 0.001	27.42	22.91	50.33
Iterated SVM cost 50 gamma 0.05	25.7	24.8	50.51
Iterated QRF ntree 1000	25.3	25.39	50.69
Iterated QRF ntree 500	25.31	25.46	50.77
Iterated QRF ntree 1500	25.4	25.4	50.8
Iterated SVM cost 100 gamma 0.05	26.1	25.16	51.25
Iterated SVM cost 1 gamma 0.01	27.41	24.4	51.81
Iterated SVM cost 1 gamma 0.05	26.41	25.88	52.29
Quantile SVM cost 1 gamma 0.001	28.79	23.67	52.46
Iterated RF ntree 1500	27.72	25.16	52.88
Iterated RF ntree 1000	27.69	25.24	52.93
Iterated RF ntree 500	27.73	25.24	52.97
Iterated SVM cost 5 gamma 0.1	27.24	25.92	53.16
Iterated SVM cost 10 gamma 0.1	27.55	26.08	53.63
Iterated SVM cost 100 gamma 0.1	27.43	26.24	53.67
Iterated SVM cost 50 gamma 0.1	27.46	26.23	53.7
Iterated SVM cost 1 gamma 0.1	28.82	26.91	55.73
Iterated SVM cost 1 gamma 0.001	31.89	24.37	56.27

Nmodels SVM cost 1 gamma 0.001	32.45	25.3	57.75
RW	73.71	98.55	172.25

Table 1.11: All setups TQE



### 1.4.3 Utility

Figure 1.12 shows the results using the Utility error measure (larger is better) for all different setups.

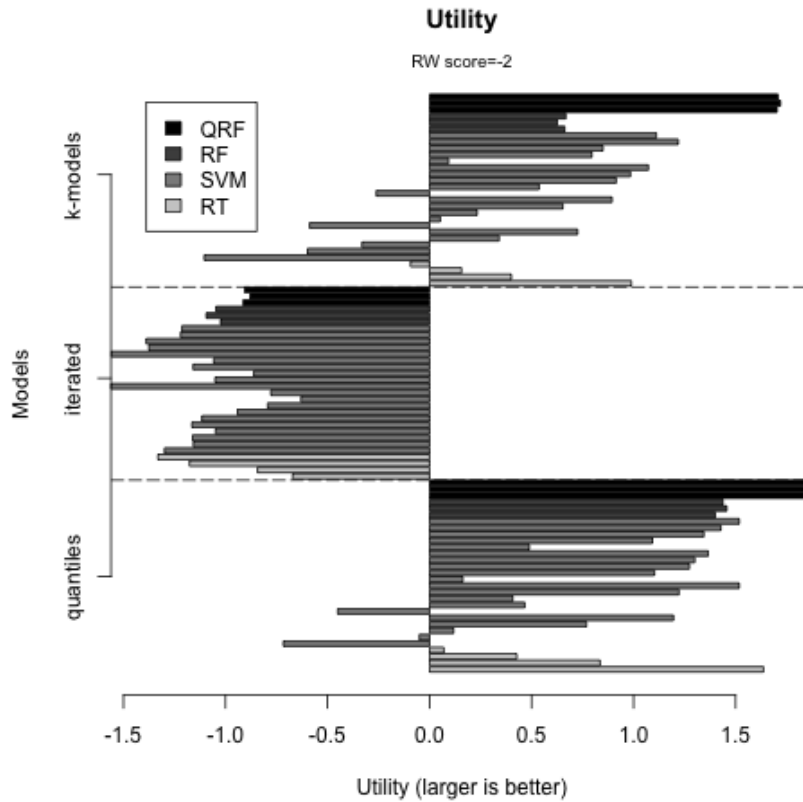


Figure 1.12: Stream 4

Table 1.12 shows all setups order by the Utility.

	utility
Quantile QRF ntree 500	1.88
Quantile QRF ntree 1000	1.86
Quantile QRF ntree 1500	1.84
Nmodels QRF ntree 1000	1.72
Nmodels QRF ntree 1500	1.71
Nmodels QRF ntree 500	1.7
Quantile RT se 0	1.64

Quantile SVM cost 100 gamma 0.01	1.52
Quantile SVM cost 100 gamma 0.1	1.52
Quantile RF ntree 1000	1.46
Quantile RF ntree 1500	1.44
Quantile SVM cost 50 gamma 0.1	1.43
Quantile RF ntree 500	1.4
Quantile SVM cost 100 gamma 0.05	1.37
Quantile SVM cost 10 gamma 0.1	1.34
Quantile SVM cost 50 gamma 0.05	1.3
Quantile SVM cost 10 gamma 0.05	1.27
Quantile SVM cost 50 gamma 0.01	1.22
Nmodels SVM cost 50 gamma 0.1	1.22
Quantile SVM cost 100 gamma 0.001	1.2
Nmodels SVM cost 100 gamma 0.1	1.11
Quantile SVM cost 5 gamma 0.05	1.1
Quantile SVM cost 5 gamma 0.1	1.09
Nmodels SVM cost 100 gamma 0.05	1.07
Nmodels RT se 0	0.99
Nmodels SVM cost 50 gamma 0.05	0.98
Nmodels SVM cost 10 gamma 0.05	0.91
Nmodels SVM cost 100 gamma 0.01	0.89
Nmodels SVM cost 10 gamma 0.1	0.85
Quantile RT se 0.5	0.84
Nmodels SVM cost 5 gamma 0.1	0.8
Quantile SVM cost 50 gamma 0.001	0.77
Nmodels SVM cost 100 gamma 0.001	0.73
Nmodels RF ntree 1500	0.67
Nmodels RF ntree 500	0.66
Nmodels SVM cost 50 gamma 0.01	0.65
Nmodels RF ntree 1000	0.63
Nmodels SVM cost 5 gamma 0.05	0.54
Quantile SVM cost 1 gamma 0.1	0.49
Quantile SVM cost 5 gamma 0.01	0.47
Quantile RT se 1	0.43
Quantile SVM cost 10 gamma 0.01	0.41
Nmodels RT se 0.5	0.4
Nmodels SVM cost 50 gamma 0.001	0.34
Nmodels SVM cost 10 gamma 0.01	0.23
Quantile SVM cost 1 gamma 0.05	0.16
Nmodels RT se 1	0.16
Quantile SVM cost 10 gamma 0.001	0.12

Nmodels SVM cost 1 gamma 0.1	0.09
Quantile RT se 1.5	0.07
Nmodels SVM cost 5 gamma 0.01	0.05
Quantile SVM cost 5 gamma 0.001	-0.05
Nmodels RT se 1.5	-0.09
Nmodels SVM cost 1 gamma 0.05	-0.26
Nmodels SVM cost 10 gamma 0.001	-0.33
Quantile SVM cost 1 gamma 0.01	-0.45
Nmodels SVM cost 1 gamma 0.01	-0.59
Nmodels SVM cost 5 gamma 0.001	-0.6
Iterated SVM cost 50 gamma 0.01	-0.63
Iterated RT se 0	-0.67
Quantile SVM cost 1 gamma 0.001	-0.72
Iterated SVM cost 100 gamma 0.01	-0.78
Iterated SVM cost 10 gamma 0.01	-0.79
Iterated RT se 0.5	-0.84
Iterated SVM cost 10 gamma 0.05	-0.86
Iterated QRF ntree 1000	-0.88
Iterated QRF ntree 1500	-0.91
Iterated QRF ntree 500	-0.91
Iterated SVM cost 5 gamma 0.01	-0.94
Iterated RF ntree 500	-1.02
Iterated RF ntree 1500	-1.05
Iterated SVM cost 50 gamma 0.001	-1.05
Iterated SVM cost 5 gamma 0.05	-1.05
Iterated SVM cost 100 gamma 0.05	-1.06
Iterated RF ntree 1000	-1.09
Nmodels SVM cost 1 gamma 0.001	-1.1
Iterated SVM cost 1 gamma 0.01	-1.12
Iterated SVM cost 5 gamma 0.001	-1.16
Iterated SVM cost 50 gamma 0.05	-1.16
Iterated SVM cost 10 gamma 0.001	-1.16
Iterated SVM cost 100 gamma 0.001	-1.16
Iterated RT se 1	-1.18
Iterated SVM cost 100 gamma 0.1	-1.21
Iterated SVM cost 50 gamma 0.1	-1.22
Iterated SVM cost 1 gamma 0.001	-1.3
Iterated RT se 1.5	-1.33
Iterated SVM cost 5 gamma 0.1	-1.38
Iterated SVM cost 10 gamma 0.1	-1.39
Iterated SVM cost 1 gamma 0.1	-1.56

Iterated SVM cost 1 gamma 0.05	-1.56
RW	-1.68

Table 1.12: All setups Utility

## 1.5 Stream 5

### 1.5.1 MAQ - Mean Absolute Quantile Deviation

Figure 1.13 shows the results using the MAQ error measure for all different setups.

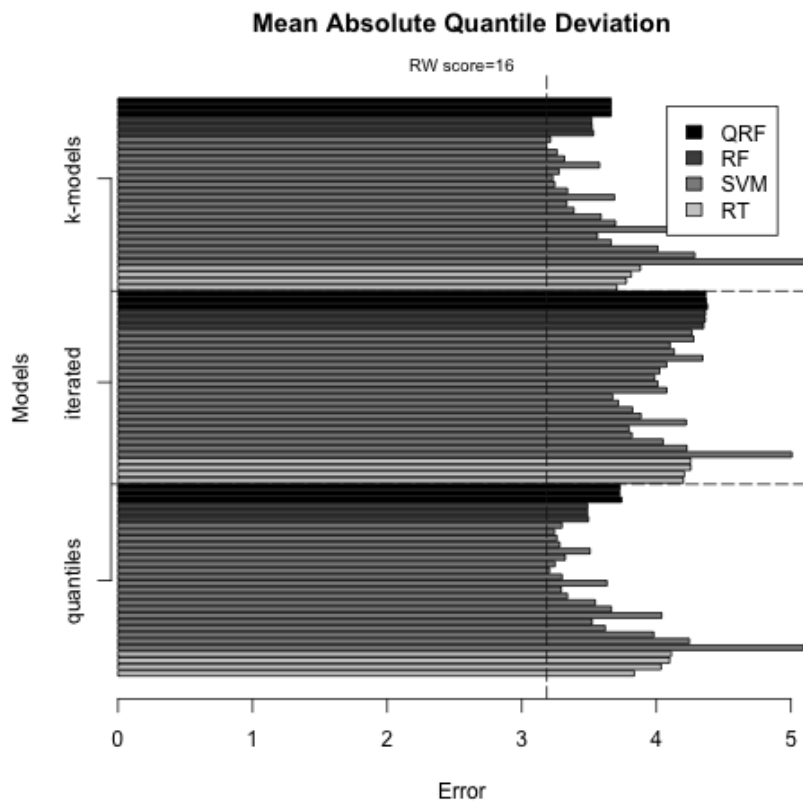


Figure 1.13: Stream 5

Table 1.13 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Nmodels SVM cost 50 gamma 0.1	3.23	3.14	3.18
Quantile SVM cost 10 gamma 0.05	3.23	3.18	3.2
Nmodels SVM cost 100 gamma 0.1	3.25	3.17	3.21
Nmodels SVM cost 50 gamma 0.05	3.27	3.19	3.23
Quantile SVM cost 50 gamma 0.1	3.21	3.27	3.24

Nmodels SVM cost 10 gamma 0.05	3.31	3.17	3.24
Quantile SVM cost 50 gamma 0.05	3.25	3.24	3.25
Quantile SVM cost 10 gamma 0.1	3.26	3.26	3.26
Nmodels SVM cost 10 gamma 0.1	3.32	3.2	3.26
Nmodels SVM cost 100 gamma 0.05	3.31	3.24	3.28
Quantile SVM cost 5 gamma 0.1	3.29	3.27	3.28
Quantile SVM cost 100 gamma 0.01	3.31	3.27	3.29
Quantile SVM cost 100 gamma 0.1	3.28	3.32	3.3
Quantile SVM cost 5 gamma 0.05	3.32	3.28	3.3
Nmodels SVM cost 5 gamma 0.1	3.37	3.26	3.32
Quantile SVM cost 100 gamma 0.05	3.3	3.34	3.32
Nmodels SVM cost 100 gamma 0.01	3.39	3.28	3.33
Quantile SVM cost 50 gamma 0.01	3.35	3.33	3.34
Nmodels SVM cost 5 gamma 0.05	3.43	3.25	3.34
Nmodels SVM cost 50 gamma 0.01	3.45	3.32	3.39
Quantile RF ntree 1000	3.48	3.49	3.49
Quantile RF ntree 1500	3.49	3.49	3.49
Quantile RF ntree 500	3.5	3.49	3.49
Quantile SVM cost 1 gamma 0.1	3.55	3.47	3.51
Nmodels RF ntree 1500	3.64	3.39	3.52
Nmodels RF ntree 1000	3.64	3.4	3.52
Quantile SVM cost 100 gamma 0.001	3.57	3.47	3.52
Nmodels RF ntree 500	3.65	3.41	3.53
Quantile SVM cost 10 gamma 0.01	3.58	3.51	3.55
Nmodels SVM cost 100 gamma 0.001	3.65	3.47	3.56
Nmodels SVM cost 1 gamma 0.1	3.65	3.51	3.58
Nmodels SVM cost 10 gamma 0.01	3.68	3.5	3.59
Quantile SVM cost 50 gamma 0.001	3.66	3.58	3.62
Quantile SVM cost 1 gamma 0.05	3.69	3.58	3.63
Nmodels QRF ntree 500	3.47	3.85	3.66
Nmodels QRF ntree 1500	3.47	3.86	3.66
Nmodels QRF ntree 1000	3.47	3.86	3.66
Nmodels SVM cost 50 gamma 0.001	3.75	3.58	3.66
Quantile SVM cost 5 gamma 0.01	3.71	3.62	3.67
Iterated SVM cost 100 gamma 0.01	3.76	3.59	3.67
Nmodels SVM cost 1 gamma 0.05	3.8	3.58	3.69
Nmodels SVM cost 5 gamma 0.01	3.78	3.61	3.7
Nmodels RT se 0	3.65	3.76	3.71
Iterated SVM cost 50 gamma 0.01	3.82	3.61	3.72
Quantile QRF ntree 1000	3.56	3.9	3.73
Quantile QRF ntree 1500	3.55	3.9	3.73

Quantile QRF ntree 500	3.57	3.91	3.74
Nmodels RT se 0.5	3.75	3.8	3.78
Iterated SVM cost 100 gamma 0.001	3.9	3.69	3.8
Nmodels RT se 1	3.78	3.84	3.81
Iterated SVM cost 50 gamma 0.001	3.91	3.73	3.82
Iterated SVM cost 10 gamma 0.01	3.92	3.72	3.82
Quantile RT se 0	3.7	3.97	3.83
Nmodels RT se 1.5	3.83	3.93	3.88
Iterated SVM cost 5 gamma 0.01	3.94	3.83	3.89
Quantile SVM cost 10 gamma 0.001	3.99	3.97	3.98
Iterated SVM cost 10 gamma 0.05	4.05	3.92	3.99
Iterated SVM cost 5 gamma 0.05	4.11	3.91	4.01
Nmodels SVM cost 10 gamma 0.001	4.08	3.95	4.01
Iterated SVM cost 50 gamma 0.05	4.11	3.94	4.02
Quantile RT se 0.5	3.96	4.11	4.03
Quantile SVM cost 1 gamma 0.01	4.08	4	4.04
Iterated SVM cost 10 gamma 0.001	4.12	3.97	4.05
Iterated SVM cost 100 gamma 0.05	4.16	4	4.08
Iterated SVM cost 1 gamma 0.05	4.15	4	4.08
Nmodels SVM cost 1 gamma 0.01	4.2	3.98	4.09
Quantile RT se 1	4.09	4.11	4.1
Iterated SVM cost 10 gamma 0.1	4.19	4.01	4.1
Quantile RT se 1.5	4.13	4.09	4.11
Iterated SVM cost 5 gamma 0.1	4.18	4.08	4.13
Iterated RT se 0	4.33	4.07	4.2
Iterated RT se 0.5	4.34	4.08	4.21
Iterated SVM cost 1 gamma 0.01	4.33	4.11	4.22
Iterated SVM cost 5 gamma 0.001	4.31	4.15	4.23
Quantile SVM cost 5 gamma 0.001	4.25	4.24	4.24
Iterated RT se 1.5	4.38	4.12	4.25
Iterated RT se 1	4.38	4.13	4.26
Iterated SVM cost 100 gamma 0.1	4.32	4.21	4.26
Iterated SVM cost 50 gamma 0.1	4.33	4.23	4.28
Nmodels SVM cost 5 gamma 0.001	4.35	4.21	4.28
Iterated SVM cost 1 gamma 0.1	4.35	4.33	4.34
Iterated RF ntree 500	4.5	4.2	4.35
Iterated RF ntree 1000	4.51	4.22	4.36
Iterated RF ntree 1500	4.51	4.22	4.36
Iterated QRF ntree 1500	4.46	4.27	4.37
Iterated QRF ntree 1000	4.47	4.28	4.37
Iterated QRF ntree 500	4.47	4.28	4.38

Iterated SVM cost 1 gamma 0.001	5.07	4.94	5.01
Quantile SVM cost 1 gamma 0.001	5.11	5.07	5.09
Nmodels SVM cost 1 gamma 0.001	5.23	5.09	5.16
RW	20.67	11.71	16.19

Table 1.13: All setups MAQ



### 1.5.2 TQE - Total Quantile Error

Figure 1.14 shows the results using the TQE error measure for all different setups.

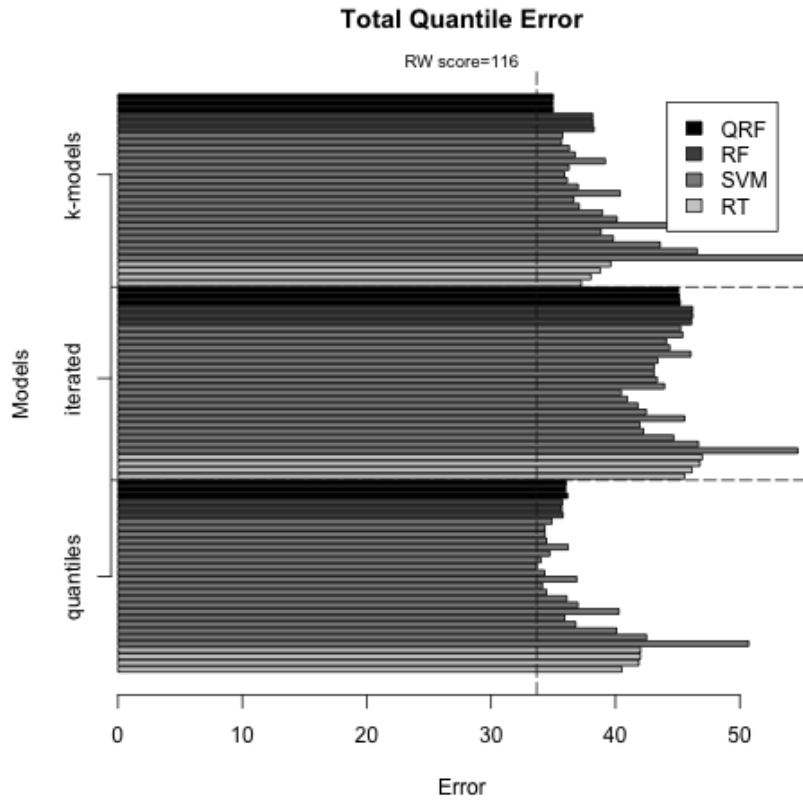


Figure 1.14: Stream 5

Table 1.14 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile SVM cost 10 gamma 0.05	17.09	16.58	33.67
Quantile SVM cost 50 gamma 0.05	17.23	16.78	34.01
Quantile SVM cost 100 gamma 0.01	17.39	16.73	34.12
Quantile SVM cost 5 gamma 0.05	17.42	16.89	34.3
Quantile SVM cost 50 gamma 0.1	17.31	17.01	34.32
Quantile SVM cost 10 gamma 0.1	17.47	16.86	34.33
Quantile SVM cost 5 gamma 0.1	17.55	16.9	34.45

Quantile SVM cost 50 gamma 0.01	17.56	16.9	34.46
Quantile SVM cost 100 gamma 0.05	17.55	17.16	34.71
Quantile SVM cost 100 gamma 0.1	17.6	17.29	34.89
Nmodels QRF ntree 1000	17.21	17.76	34.97
Nmodels QRF ntree 500	17.22	17.76	34.98
Nmodels QRF ntree 1500	17.22	17.77	34.99
Nmodels SVM cost 50 gamma 0.1	18.19	17.47	35.66
Quantile RF ntree 1000	18.3	17.38	35.69
Quantile RF ntree 1500	18.35	17.39	35.74
Nmodels SVM cost 100 gamma 0.1	18.26	17.5	35.76
Quantile RF ntree 500	18.4	17.38	35.78
Nmodels SVM cost 50 gamma 0.05	18.2	17.7	35.89
Quantile SVM cost 100 gamma 0.001	18.15	17.76	35.91
Quantile QRF ntree 1000	17.81	18.18	36
Quantile QRF ntree 1500	17.84	18.19	36.03
Quantile SVM cost 10 gamma 0.01	18.59	17.49	36.08
Nmodels SVM cost 10 gamma 0.05	18.49	17.64	36.12
Quantile QRF ntree 500	17.9	18.25	36.15
Quantile SVM cost 1 gamma 0.1	18.64	17.55	36.19
Nmodels SVM cost 100 gamma 0.05	18.41	17.86	36.26
Nmodels SVM cost 10 gamma 0.1	18.5	17.79	36.29
Nmodels SVM cost 100 gamma 0.01	18.94	17.7	36.64
Nmodels SVM cost 5 gamma 0.1	18.75	18	36.75
Quantile SVM cost 50 gamma 0.001	18.55	18.25	36.8
Quantile SVM cost 1 gamma 0.05	19.18	17.7	36.88
Quantile SVM cost 5 gamma 0.01	19.15	17.84	36.99
Nmodels SVM cost 5 gamma 0.05	19.06	17.94	37
Nmodels SVM cost 50 gamma 0.01	19.23	17.85	37.08
Nmodels RT se 0	19.08	18.18	37.26
Nmodels RT se 0.5	19.55	18.48	38.03
Nmodels RF ntree 1500	20.08	18.08	38.16
Nmodels RF ntree 1000	20.08	18.1	38.18
Nmodels RF ntree 500	20.13	18.15	38.27
Nmodels RT se 1	19.96	18.81	38.77
Nmodels SVM cost 100 gamma 0.001	19.81	19.02	38.84
Nmodels SVM cost 10 gamma 0.01	20.31	18.64	38.95
Nmodels SVM cost 1 gamma 0.1	20.19	18.99	39.18
Nmodels RT se 1.5	20.32	19.3	39.62
Nmodels SVM cost 50 gamma 0.001	20.33	19.49	39.82
Quantile SVM cost 10 gamma 0.001	20.17	19.92	40.09
Nmodels SVM cost 5 gamma 0.01	20.93	19.19	40.12

Quantile SVM cost 1 gamma 0.01	20.96	19.32	40.28
Nmodels SVM cost 1 gamma 0.05	21.23	19.14	40.37
Iterated SVM cost 100 gamma 0.01	20.76	19.71	40.47
Quantile RT se 0	20.52	19.99	40.51
Iterated SVM cost 50 gamma 0.01	21.06	19.9	40.96
Iterated SVM cost 10 gamma 0.01	21.51	20.29	41.8
Quantile RT se 0.5	21.35	20.54	41.89
Iterated SVM cost 100 gamma 0.001	21.33	20.63	41.96
Quantile RT se 1	21.59	20.41	42.01
Quantile RT se 1.5	21.75	20.28	42.02
Iterated SVM cost 50 gamma 0.001	21.57	20.69	42.26
Iterated SVM cost 5 gamma 0.01	21.69	20.79	42.48
Quantile SVM cost 5 gamma 0.001	21.35	21.15	42.5
Iterated SVM cost 10 gamma 0.05	22.54	20.55	43.1
Iterated SVM cost 50 gamma 0.05	22.35	20.78	43.13
Iterated SVM cost 5 gamma 0.05	22.8	20.55	43.36
Iterated SVM cost 100 gamma 0.05	22.44	20.97	43.41
Nmodels SVM cost 10 gamma 0.001	22.16	21.43	43.6
Iterated SVM cost 1 gamma 0.05	22.92	21.02	43.94
Iterated SVM cost 10 gamma 0.1	23.12	20.97	44.1
Iterated SVM cost 5 gamma 0.1	23.22	21.15	44.37
Nmodels SVM cost 1 gamma 0.01	23.45	20.97	44.42
Iterated SVM cost 10 gamma 0.001	22.6	22.08	44.68
Iterated QRF ntree 1500	23.11	21.97	45.08
Iterated QRF ntree 1000	23.18	21.96	45.14
Iterated QRF ntree 500	23.25	21.96	45.2
Iterated SVM cost 100 gamma 0.1	23.29	21.95	45.24
Iterated SVM cost 50 gamma 0.1	23.49	21.91	45.4
Iterated RT se 0	23.7	21.85	45.55
Iterated SVM cost 1 gamma 0.01	24.04	21.52	45.56
Iterated SVM cost 1 gamma 0.1	24.08	21.98	46.06
Iterated RF ntree 500	24.64	21.48	46.11
Iterated RT se 0.5	24.05	22.11	46.16
Iterated RF ntree 1500	24.65	21.56	46.2
Iterated RF ntree 1000	24.6	21.62	46.22
Nmodels SVM cost 5 gamma 0.001	23.7	22.87	46.57
Iterated SVM cost 5 gamma 0.001	23.58	23.09	46.67
Iterated RT se 1	24.48	22.31	46.79
Iterated RT se 1.5	24.5	22.48	46.99
Quantile SVM cost 1 gamma 0.001	25.45	25.26	50.71
Iterated SVM cost 1 gamma 0.001	27.9	26.76	54.66

Nmodels SVM cost 1 gamma 0.001	28.42	27.44	55.86
RW	71.21	44.31	115.51

Table 1.14: All setups TQE

### 1.5.3 Utility

Figure 1.15 shows the results using the Utility error measure (larger is better) for all different setups.

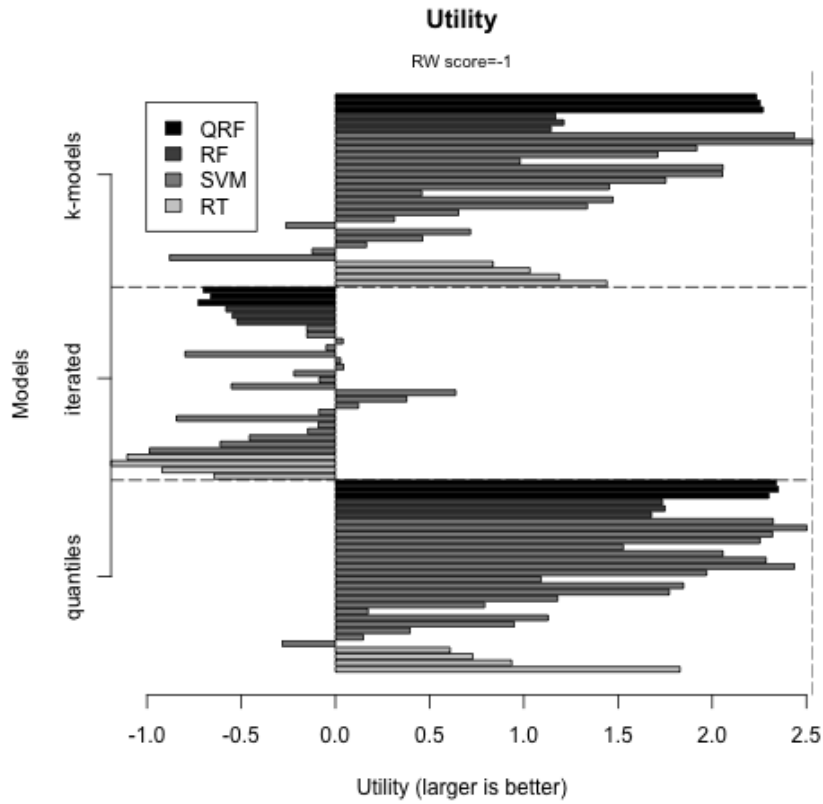


Figure 1.15: Stream 5

Table 1.15 shows all setups order by the Utility.

	utility
Nmodels SVM cost 50 gamma 0.1	2.53
Quantile SVM cost 50 gamma 0.1	2.5
Nmodels SVM cost 100 gamma 0.1	2.44
Quantile SVM cost 10 gamma 0.05	2.44
Quantile QRF ntree 1000	2.35
Quantile QRF ntree 1500	2.34
Quantile SVM cost 100 gamma 0.1	2.32

Quantile SVM cost 10 gamma 0.1	2.32
Quantile QRF ntree 500	2.3
Quantile SVM cost 50 gamma 0.05	2.29
Nmodels QRF ntree 500	2.27
Quantile SVM cost 5 gamma 0.1	2.25
Nmodels QRF ntree 1000	2.25
Nmodels QRF ntree 1500	2.23
Quantile SVM cost 100 gamma 0.05	2.06
Nmodels SVM cost 100 gamma 0.05	2.06
Nmodels SVM cost 50 gamma 0.05	2.05
Quantile SVM cost 5 gamma 0.05	1.97
Nmodels SVM cost 10 gamma 0.1	1.92
Quantile SVM cost 100 gamma 0.01	1.85
Quantile RT se 0	1.83
Quantile SVM cost 50 gamma 0.01	1.77
Nmodels SVM cost 10 gamma 0.05	1.75
Quantile RF ntree 1000	1.75
Quantile RF ntree 1500	1.74
Nmodels SVM cost 5 gamma 0.1	1.71
Quantile RF ntree 500	1.68
Quantile SVM cost 1 gamma 0.1	1.53
Nmodels SVM cost 100 gamma 0.01	1.47
Nmodels SVM cost 5 gamma 0.05	1.45
Nmodels RT se 0	1.44
Nmodels SVM cost 50 gamma 0.01	1.34
Nmodels RF ntree 1000	1.21
Nmodels RT se 0.5	1.19
Quantile SVM cost 10 gamma 0.01	1.18
Nmodels RF ntree 1500	1.17
Nmodels RF ntree 500	1.14
Quantile SVM cost 100 gamma 0.001	1.13
Quantile SVM cost 1 gamma 0.05	1.09
Nmodels RT se 1	1.03
Nmodels SVM cost 1 gamma 0.1	0.98
Quantile SVM cost 50 gamma 0.001	0.95
Quantile RT se 0.5	0.94
Nmodels RT se 1.5	0.84
Quantile SVM cost 5 gamma 0.01	0.79
Quantile RT se 1	0.73
Nmodels SVM cost 100 gamma 0.001	0.72
Nmodels SVM cost 10 gamma 0.01	0.65

Iterated SVM cost 100 gamma 0.01	0.64
Quantile RT se 1.5	0.61
Nmodels SVM cost 50 gamma 0.001	0.46
Nmodels SVM cost 1 gamma 0.05	0.46
Quantile SVM cost 10 gamma 0.001	0.4
Iterated SVM cost 50 gamma 0.01	0.38
Nmodels SVM cost 5 gamma 0.01	0.31
Quantile SVM cost 1 gamma 0.01	0.17
Nmodels SVM cost 10 gamma 0.001	0.16
Quantile SVM cost 5 gamma 0.001	0.15
Iterated SVM cost 10 gamma 0.01	0.12
Iterated SVM cost 50 gamma 0.05	0.04
Iterated SVM cost 10 gamma 0.1	0.04
Iterated SVM cost 100 gamma 0.05	0.03
Iterated SVM cost 5 gamma 0.1	-0.05
Iterated SVM cost 5 gamma 0.05	-0.09
Iterated SVM cost 5 gamma 0.01	-0.09
Iterated SVM cost 100 gamma 0.001	-0.09
Nmodels SVM cost 5 gamma 0.001	-0.12
Iterated SVM cost 50 gamma 0.001	-0.15
Iterated SVM cost 50 gamma 0.1	-0.15
Iterated SVM cost 100 gamma 0.1	-0.15
Iterated SVM cost 10 gamma 0.05	-0.22
Nmodels SVM cost 1 gamma 0.01	-0.26
Quantile SVM cost 1 gamma 0.001	-0.28
Iterated SVM cost 10 gamma 0.001	-0.46
Iterated RF ntree 500	-0.52
Iterated RF ntree 1000	-0.55
Iterated SVM cost 1 gamma 0.05	-0.55
Iterated RF ntree 1500	-0.58
Iterated SVM cost 5 gamma 0.001	-0.61
Iterated RT se 0	-0.64
Iterated QRF ntree 1000	-0.66
Iterated QRF ntree 1500	-0.7
Iterated QRF ntree 500	-0.73
Iterated SVM cost 1 gamma 0.1	-0.8
Iterated SVM cost 1 gamma 0.01	-0.84
Nmodels SVM cost 1 gamma 0.001	-0.88
Iterated RT se 0.5	-0.92
Iterated SVM cost 1 gamma 0.001	-0.99
Iterated RT se 1.5	-1.11

Iterated RT se 1	-1.19
RW	-1.23

Table 1.15: All setups Utility



## 1.6 Stream 6

### 1.6.1 MAQ - Mean Absolute Quantile Deviation

Figure 1.16 shows the results using the MAQ error measure for all different setups.

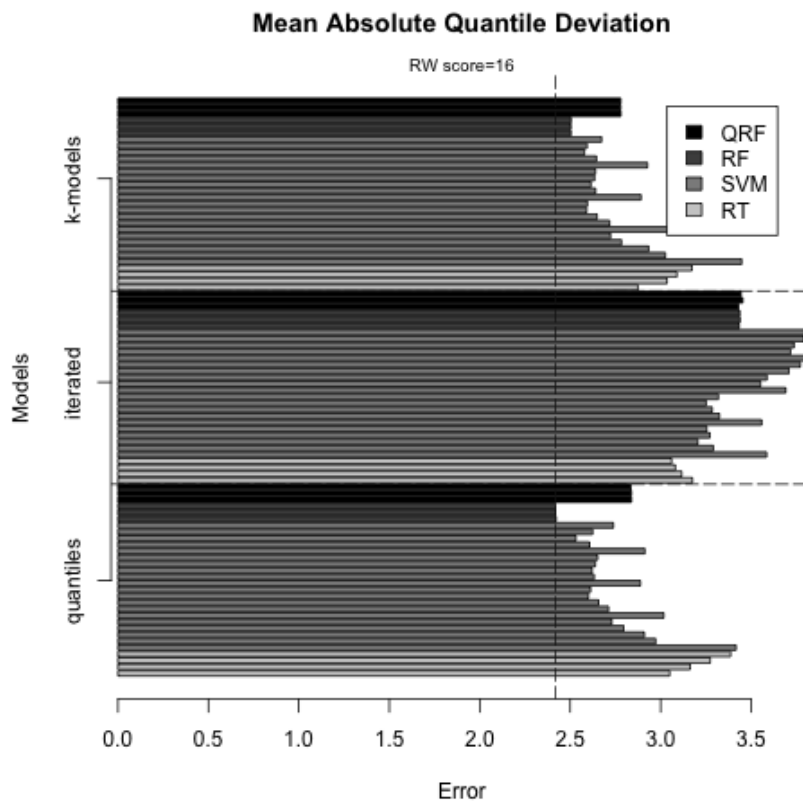


Figure 1.16: Stream 6

Table 1.16 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile RF ntree 1500	2.42	2.42	2.42
Quantile RF ntree 1000	2.42	2.42	2.42
Quantile RF ntree 500	2.42	2.43	2.42
Nmodels RF ntree 1000	2.5	2.51	2.5
Nmodels RF ntree 500	2.5	2.51	2.5

Nmodels RF ntree 1500	2.5	2.51	2.5
Quantile SVM cost 10 gamma 0.1	2.65	2.42	2.53
Nmodels SVM cost 10 gamma 0.1	2.69	2.46	2.58
Nmodels SVM cost 50 gamma 0.01	2.62	2.56	2.59
Nmodels SVM cost 50 gamma 0.1	2.74	2.45	2.59
Nmodels SVM cost 100 gamma 0.01	2.64	2.55	2.59
Quantile SVM cost 50 gamma 0.01	2.71	2.49	2.6
Quantile SVM cost 5 gamma 0.1	2.74	2.47	2.61
Quantile SVM cost 100 gamma 0.01	2.73	2.5	2.61
Nmodels SVM cost 10 gamma 0.05	2.73	2.5	2.61
Quantile SVM cost 10 gamma 0.05	2.75	2.49	2.62
Quantile SVM cost 50 gamma 0.1	2.72	2.53	2.62
Quantile SVM cost 5 gamma 0.05	2.78	2.49	2.63
Nmodels SVM cost 50 gamma 0.05	2.76	2.51	2.63
Quantile SVM cost 50 gamma 0.05	2.74	2.53	2.64
Nmodels SVM cost 100 gamma 0.05	2.74	2.54	2.64
Nmodels SVM cost 5 gamma 0.05	2.74	2.54	2.64
Nmodels SVM cost 5 gamma 0.1	2.75	2.54	2.64
Nmodels SVM cost 10 gamma 0.01	2.65	2.64	2.65
Quantile SVM cost 100 gamma 0.05	2.77	2.54	2.65
Quantile SVM cost 10 gamma 0.01	2.72	2.59	2.66
Nmodels SVM cost 100 gamma 0.1	2.84	2.51	2.67
Quantile SVM cost 5 gamma 0.01	2.76	2.66	2.71
Nmodels SVM cost 5 gamma 0.01	2.71	2.72	2.72
Nmodels SVM cost 100 gamma 0.001	2.69	2.75	2.72
Quantile SVM cost 100 gamma 0.001	2.8	2.66	2.73
Quantile SVM cost 100 gamma 0.1	2.85	2.63	2.74
Nmodels QRF ntree 1000	2.94	2.61	2.78
Nmodels QRF ntree 1500	2.94	2.62	2.78
Nmodels QRF ntree 500	2.94	2.62	2.78
Nmodels SVM cost 50 gamma 0.001	2.74	2.82	2.78
Quantile SVM cost 50 gamma 0.001	2.87	2.72	2.8
Quantile QRF ntree 1500	3.02	2.66	2.84
Quantile QRF ntree 1000	3.02	2.66	2.84
Quantile QRF ntree 500	3.02	2.66	2.84
Nmodels RT se 0	3.02	2.72	2.87
Quantile SVM cost 1 gamma 0.05	3.01	2.77	2.89
Nmodels SVM cost 1 gamma 0.05	2.9	2.88	2.89
Quantile SVM cost 10 gamma 0.001	3.02	2.8	2.91
Quantile SVM cost 1 gamma 0.1	3.05	2.78	2.91
Nmodels SVM cost 1 gamma 0.1	3	2.86	2.93

Nmodels SVM cost 10 gamma 0.001	2.88	2.99	2.93
Quantile SVM cost 5 gamma 0.001	3.11	2.83	2.97
Quantile SVM cost 1 gamma 0.01	3.08	2.96	3.02
Nmodels SVM cost 5 gamma 0.001	3	3.05	3.03
Nmodels RT se 0.5	3.19	2.88	3.03
Nmodels SVM cost 1 gamma 0.01	2.96	3.12	3.04
Quantile RT se 0	3	3.1	3.05
Iterated RT se 1.5	3.1	3.02	3.06
Iterated RT se 1	3.13	3.03	3.08
Nmodels RT se 1	3.26	2.92	3.09
Iterated RT se 0.5	3.19	3.04	3.12
Quantile RT se 0.5	3.18	3.14	3.16
Nmodels RT se 1.5	3.3	3.05	3.17
Iterated RT se 0	3.25	3.1	3.18
Iterated SVM cost 10 gamma 0.001	3.13	3.28	3.21
Iterated SVM cost 50 gamma 0.01	3.27	3.24	3.25
Iterated SVM cost 100 gamma 0.001	3.18	3.33	3.25
Iterated SVM cost 50 gamma 0.001	3.19	3.35	3.27
Quantile RT se 1	3.36	3.19	3.27
Iterated SVM cost 10 gamma 0.01	3.27	3.3	3.28
Iterated SVM cost 5 gamma 0.001	3.23	3.35	3.29
Iterated SVM cost 100 gamma 0.01	3.34	3.3	3.32
Iterated SVM cost 5 gamma 0.01	3.32	3.33	3.32
Quantile RT se 1.5	3.47	3.3	3.39
Quantile SVM cost 1 gamma 0.001	3.57	3.26	3.42
Iterated QRF ntree 500	3.52	3.34	3.43
Iterated RF ntree 500	3.6	3.27	3.43
Iterated RF ntree 1500	3.6	3.27	3.44
Iterated RF ntree 1000	3.6	3.27	3.44
Iterated QRF ntree 1500	3.54	3.35	3.44
Nmodels SVM cost 1 gamma 0.001	3.52	3.38	3.45
Iterated QRF ntree 1000	3.55	3.35	3.45
Iterated SVM cost 5 gamma 0.05	3.63	3.48	3.55
Iterated SVM cost 1 gamma 0.01	3.52	3.6	3.56
Iterated SVM cost 1 gamma 0.001	3.62	3.55	3.59
Iterated SVM cost 10 gamma 0.05	3.7	3.47	3.59
Iterated SVM cost 1 gamma 0.05	3.69	3.69	3.69
Iterated SVM cost 50 gamma 0.05	3.76	3.66	3.71
Iterated SVM cost 5 gamma 0.1	3.79	3.64	3.72
Iterated SVM cost 10 gamma 0.1	3.79	3.68	3.74
Iterated SVM cost 100 gamma 0.05	3.83	3.71	3.77

Iterated SVM cost 50 gamma 0.1	3.84	3.74	3.79
Iterated SVM cost 100 gamma 0.1	3.87	3.72	3.8
Iterated SVM cost 1 gamma 0.1	3.84	3.84	3.84
RW	16.81	16.11	16.46

Table 1.16: All setups MAQ

## 1.6.2 TQE - Total Quantile Error

Figure 1.17 shows the results using the TQE error measure for all different setups.

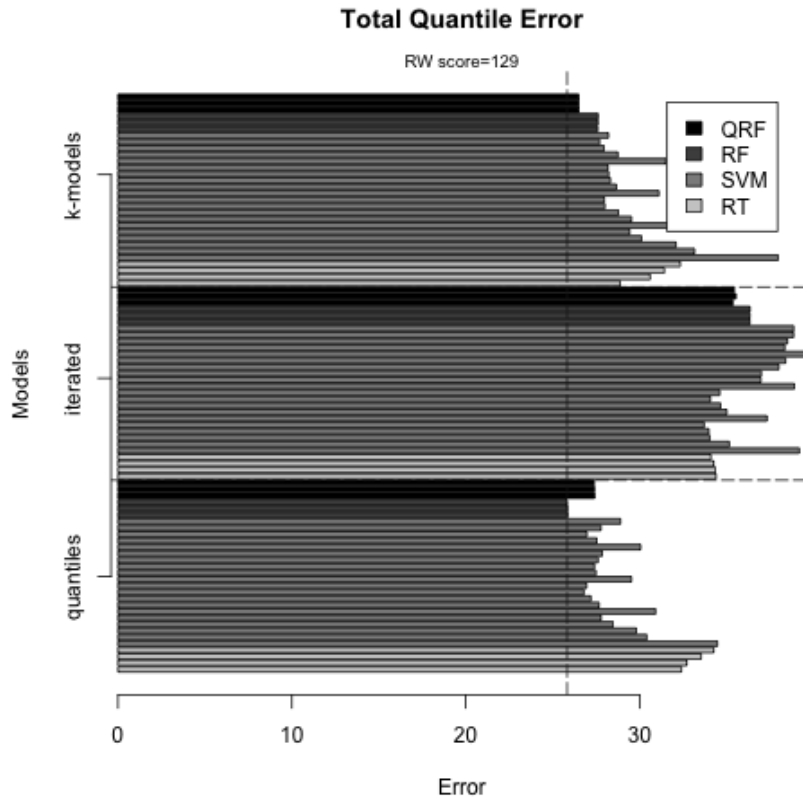


Figure 1.17: Stream 6

Table 1.17 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile RF ntree 1500	12.4	13.42	25.82
Quantile RF ntree 1000	12.39	13.45	25.83
Quantile RF ntree 500	12.4	13.45	25.85
Nmodels QRF ntree 1500	13.19	13.3	26.49
Nmodels QRF ntree 1000	13.19	13.3	26.49
Nmodels QRF ntree 500	13.19	13.31	26.5
Quantile SVM cost 50 gamma 0.01	13.05	13.74	26.78

Quantile SVM cost 100 gamma 0.01	13.11	13.83	26.94
Quantile SVM cost 10 gamma 0.1	13.38	13.58	26.96
Quantile SVM cost 10 gamma 0.01	13.12	14.07	27.19
Quantile QRF ntree 1500	13.71	13.66	27.38
Quantile SVM cost 10 gamma 0.05	13.55	13.84	27.39
Quantile QRF ntree 1000	13.72	13.68	27.39
Quantile QRF ntree 500	13.71	13.7	27.4
Quantile SVM cost 5 gamma 0.05	13.59	13.89	27.48
Quantile SVM cost 5 gamma 0.1	13.72	13.82	27.53
Nmodels RF ntree 500	13.08	14.5	27.58
Nmodels RF ntree 1000	13.08	14.51	27.59
Quantile SVM cost 50 gamma 0.05	13.62	13.98	27.6
Nmodels RF ntree 1500	13.08	14.52	27.6
Quantile SVM cost 5 gamma 0.01	13.24	14.42	27.66
Nmodels SVM cost 50 gamma 0.1	13.79	13.89	27.69
Quantile SVM cost 50 gamma 0.1	13.72	14.05	27.77
Quantile SVM cost 100 gamma 0.001	13.45	14.33	27.77
Quantile SVM cost 100 gamma 0.05	13.74	14.09	27.83
Nmodels SVM cost 10 gamma 0.1	13.79	14.14	27.93
Nmodels SVM cost 100 gamma 0.01	13.32	14.63	27.95
Nmodels SVM cost 50 gamma 0.01	13.3	14.69	27.99
Nmodels SVM cost 100 gamma 0.05	13.82	14.34	28.17
Nmodels SVM cost 100 gamma 0.1	14.11	14.09	28.2
Nmodels SVM cost 50 gamma 0.05	13.92	14.29	28.21
Nmodels SVM cost 10 gamma 0.05	13.88	14.42	28.31
Quantile SVM cost 50 gamma 0.001	13.76	14.7	28.46
Nmodels SVM cost 5 gamma 0.05	13.93	14.71	28.64
Nmodels SVM cost 5 gamma 0.1	14.13	14.61	28.74
Nmodels SVM cost 10 gamma 0.01	13.61	15.15	28.76
Nmodels RT se 0	14.46	14.41	28.86
Quantile SVM cost 100 gamma 0.1	14.27	14.62	28.89
Nmodels SVM cost 100 gamma 0.001	13.71	15.71	29.41
Quantile SVM cost 1 gamma 0.05	14.22	15.3	29.52
Nmodels SVM cost 5 gamma 0.01	13.85	15.67	29.52
Quantile SVM cost 10 gamma 0.001	14.44	15.36	29.8
Quantile SVM cost 1 gamma 0.1	14.81	15.24	30.05
Nmodels SVM cost 50 gamma 0.001	13.95	16.14	30.09
Quantile SVM cost 5 gamma 0.001	14.81	15.59	30.4
Nmodels RT se 0.5	15.4	15.19	30.59
Quantile SVM cost 1 gamma 0.01	14.62	16.29	30.9
Nmodels SVM cost 1 gamma 0.05	14.67	16.43	31.1

Nmodels RT se 1	15.95	15.46	31.41
Nmodels SVM cost 1 gamma 0.1	15.27	16.23	31.49
Nmodels SVM cost 10 gamma 0.001	14.71	17.37	32.08
Nmodels RT se 1.5	16.13	16.19	32.32
Quantile RT se 0	15.5	16.89	32.39
Quantile RT se 0.5	15.93	16.77	32.7
Nmodels SVM cost 1 gamma 0.01	15	18.07	33.07
Nmodels SVM cost 5 gamma 0.001	15.3	17.85	33.15
Quantile RT se 1	16.67	16.86	33.52
Iterated SVM cost 100 gamma 0.001	15.46	18.24	33.7
Iterated SVM cost 50 gamma 0.001	15.55	18.42	33.97
Iterated SVM cost 10 gamma 0.001	15.42	18.6	34.02
Iterated SVM cost 50 gamma 0.01	15.64	18.42	34.06
Iterated RT se 1.5	16.56	17.53	34.09
Iterated RT se 1	16.74	17.51	34.25
Quantile RT se 1.5	16.98	17.27	34.25
Iterated RT se 0.5	16.77	17.58	34.35
Iterated RT se 0	16.93	17.45	34.38
Quantile SVM cost 1 gamma 0.001	16.69	17.77	34.46
Iterated SVM cost 100 gamma 0.01	16.2	18.4	34.6
Iterated SVM cost 10 gamma 0.01	15.78	18.86	34.64
Iterated SVM cost 5 gamma 0.01	15.84	19.16	35
Iterated SVM cost 5 gamma 0.001	15.77	19.37	35.14
Iterated QRF ntree 500	16.72	18.63	35.35
Iterated QRF ntree 1500	16.77	18.66	35.43
Iterated QRF ntree 1000	16.83	18.7	35.53
Iterated RF ntree 500	17.62	18.7	36.32
Iterated RF ntree 1000	17.6	18.72	36.32
Iterated RF ntree 1500	17.62	18.72	36.33
Iterated SVM cost 5 gamma 0.05	17.29	19.67	36.96
Iterated SVM cost 10 gamma 0.05	17.51	19.47	36.98
Iterated SVM cost 1 gamma 0.01	16.75	20.56	37.31
Nmodels SVM cost 1 gamma 0.001	18.06	19.88	37.94
Iterated SVM cost 50 gamma 0.05	17.9	20.09	37.99
Iterated SVM cost 5 gamma 0.1	18.01	20.33	38.33
Iterated SVM cost 100 gamma 0.05	18.27	20.11	38.38
Iterated SVM cost 10 gamma 0.1	17.99	20.49	38.48
Iterated SVM cost 50 gamma 0.1	18.13	20.71	38.84
Iterated SVM cost 100 gamma 0.1	18.2	20.64	38.84
Iterated SVM cost 1 gamma 0.05	18.15	20.74	38.89
Iterated SVM cost 1 gamma 0.001	18.36	20.81	39.17

Iterated SVM cost 1 gamma 0.1	18.83	21.11	39.94
RW	66.39	62.81	129.2

Table 1.17: All setups TQE



### 1.6.3 Utility

Figure 1.18 shows the results using the Utility error measure (larger is better) for all different setups.

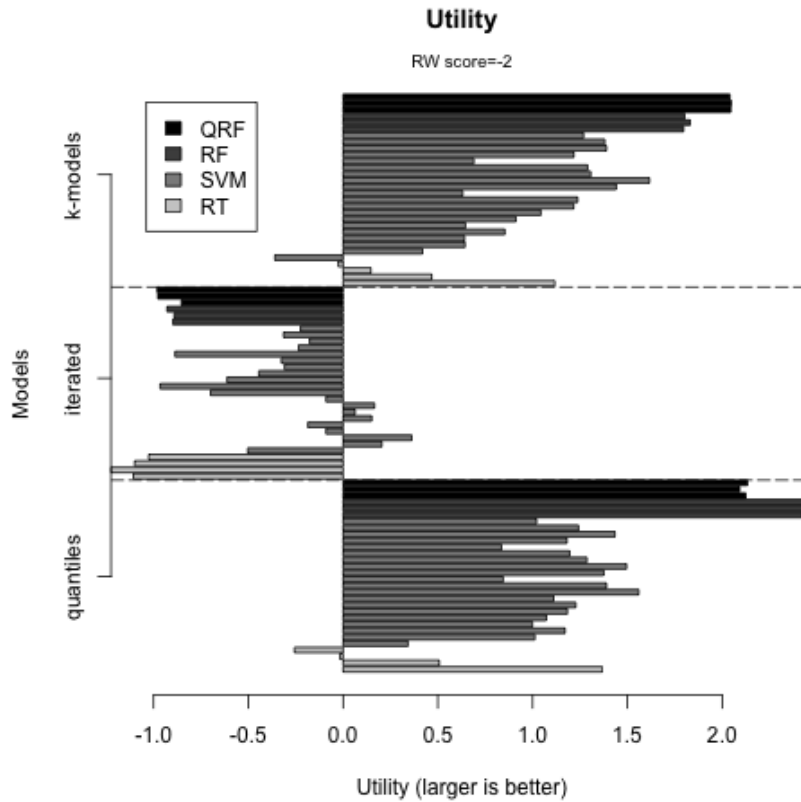


Figure 1.18: Stream 6

Table 1.18 shows all setups order by the Utility.

	utility
Quantile RF ntree 1500	2.48
Quantile RF ntree 1000	2.45
Quantile RF ntree 500	2.42
Quantile QRF ntree 1500	2.13
Quantile QRF ntree 500	2.13
Quantile QRF ntree 1000	2.09
Nmodels QRF ntree 1000	2.05

Nmodels QRF ntree 500	2.05
Nmodels QRF ntree 1500	2.04
Nmodels RF ntree 1000	1.83
Nmodels RF ntree 1500	1.8
Nmodels RF ntree 500	1.8
Nmodels SVM cost 10 gamma 0.05	1.62
Quantile SVM cost 50 gamma 0.01	1.56
Quantile SVM cost 10 gamma 0.05	1.5
Nmodels SVM cost 5 gamma 0.05	1.44
Quantile SVM cost 10 gamma 0.1	1.43
Quantile SVM cost 100 gamma 0.01	1.39
Nmodels SVM cost 10 gamma 0.1	1.39
Nmodels SVM cost 50 gamma 0.1	1.38
Quantile SVM cost 5 gamma 0.05	1.38
Quantile RT se 0	1.37
Nmodels SVM cost 50 gamma 0.05	1.31
Nmodels SVM cost 100 gamma 0.05	1.29
Quantile SVM cost 50 gamma 0.05	1.29
Nmodels SVM cost 100 gamma 0.1	1.27
Quantile SVM cost 50 gamma 0.1	1.24
Nmodels SVM cost 100 gamma 0.01	1.24
Quantile SVM cost 5 gamma 0.01	1.23
Nmodels SVM cost 5 gamma 0.1	1.22
Nmodels SVM cost 50 gamma 0.01	1.22
Quantile SVM cost 100 gamma 0.05	1.2
Quantile SVM cost 1 gamma 0.01	1.18
Quantile SVM cost 5 gamma 0.1	1.18
Quantile SVM cost 10 gamma 0.001	1.17
Nmodels RT se 0	1.12
Quantile SVM cost 10 gamma 0.01	1.11
Quantile SVM cost 100 gamma 0.001	1.07
Nmodels SVM cost 10 gamma 0.01	1.04
Quantile SVM cost 100 gamma 0.1	1.02
Quantile SVM cost 5 gamma 0.001	1.01
Quantile SVM cost 50 gamma 0.001	1
Nmodels SVM cost 5 gamma 0.01	0.91
Nmodels SVM cost 100 gamma 0.001	0.85
Quantile SVM cost 1 gamma 0.05	0.84
Quantile SVM cost 1 gamma 0.1	0.84
Nmodels SVM cost 1 gamma 0.1	0.69
Nmodels SVM cost 1 gamma 0.01	0.65

Nmodels SVM cost 10 gamma 0.001	0.64
Nmodels SVM cost 50 gamma 0.001	0.64
Nmodels SVM cost 1 gamma 0.05	0.63
Quantile RT se 0.5	0.51
Nmodels RT se 0.5	0.47
Nmodels SVM cost 5 gamma 0.001	0.42
Iterated SVM cost 10 gamma 0.001	0.36
Quantile SVM cost 1 gamma 0.001	0.34
Iterated SVM cost 5 gamma 0.001	0.2
Iterated SVM cost 10 gamma 0.01	0.17
Iterated SVM cost 1 gamma 0.01	0.15
Nmodels RT se 1	0.15
Iterated SVM cost 5 gamma 0.01	0.06
Quantile RT se 1	-0.02
Nmodels RT se 1.5	-0.03
Iterated SVM cost 50 gamma 0.001	-0.09
Iterated SVM cost 50 gamma 0.01	-0.09
Iterated SVM cost 10 gamma 0.1	-0.18
Iterated SVM cost 100 gamma 0.001	-0.19
Iterated SVM cost 100 gamma 0.1	-0.22
Iterated SVM cost 5 gamma 0.1	-0.23
Quantile RT se 1.5	-0.26
Iterated SVM cost 50 gamma 0.05	-0.31
Iterated SVM cost 50 gamma 0.1	-0.31
Iterated SVM cost 100 gamma 0.05	-0.33
Nmodels SVM cost 1 gamma 0.001	-0.36
Iterated SVM cost 10 gamma 0.05	-0.44
Iterated SVM cost 1 gamma 0.001	-0.5
Iterated SVM cost 5 gamma 0.05	-0.61
Iterated SVM cost 100 gamma 0.01	-0.7
Iterated QRF ntree 500	-0.85
Iterated SVM cost 1 gamma 0.1	-0.89
Iterated RF ntree 1000	-0.89
Iterated RF ntree 500	-0.9
Iterated RF ntree 1500	-0.93
Iterated SVM cost 1 gamma 0.05	-0.97
Iterated QRF ntree 1000	-0.98
Iterated QRF ntree 1500	-0.98
Iterated RT se 1.5	-1.03
Iterated RT se 1	-1.1
Iterated RT se 0	-1.11

Iterated RT se 0.5	-1.22
RW	-2.16

Table 1.18: All setups Utility

## 1.7 Stream 7

### 1.7.1 MAQ - Mean Absolute Quantile Deviation

Figure 1.19 shows the results using the MAQ error measure for all different setups.

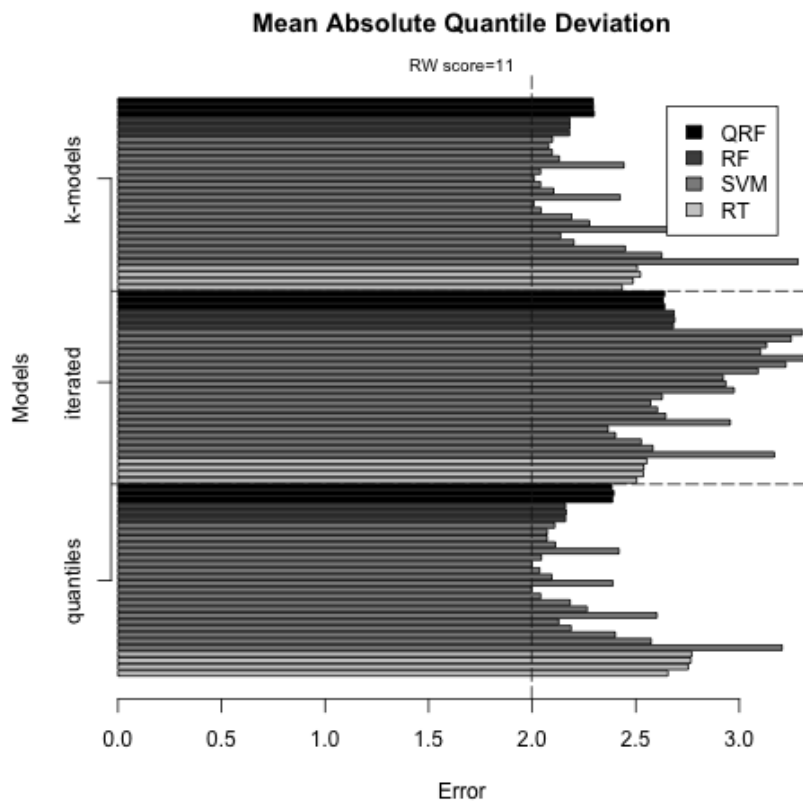


Figure 1.19: Stream 7

Table 1.19 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile SVM cost 100 gamma 0.01	1.97	2.03	2
Quantile SVM cost 50 gamma 0.05	1.96	2.04	2
Nmodels SVM cost 100 gamma 0.01	2.04	1.98	2.01
Nmodels SVM cost 50 gamma 0.05	2.03	1.99	2.01
Quantile SVM cost 10 gamma 0.05	2	2.07	2.04

Nmodels SVM cost 100 gamma 0.05	2.05	2.03	2.04
Nmodels SVM cost 10 gamma 0.05	2.07	2.01	2.04
Quantile SVM cost 50 gamma 0.01	2.01	2.07	2.04
Nmodels SVM cost 50 gamma 0.01	2.07	2.01	2.04
Quantile SVM cost 100 gamma 0.05	1.99	2.09	2.04
Quantile SVM cost 10 gamma 0.1	2.03	2.11	2.07
Quantile SVM cost 50 gamma 0.1	2.03	2.12	2.07
Nmodels SVM cost 50 gamma 0.1	2.13	2.03	2.08
Quantile SVM cost 5 gamma 0.05	2.07	2.12	2.1
Nmodels SVM cost 10 gamma 0.1	2.14	2.05	2.1
Nmodels SVM cost 100 gamma 0.1	2.12	2.07	2.1
Nmodels SVM cost 5 gamma 0.05	2.14	2.07	2.1
Quantile SVM cost 100 gamma 0.1	2.06	2.16	2.11
Quantile SVM cost 5 gamma 0.1	2.07	2.16	2.11
Quantile SVM cost 100 gamma 0.001	2.07	2.19	2.13
Nmodels SVM cost 5 gamma 0.1	2.18	2.08	2.13
Nmodels SVM cost 100 gamma 0.001	2.21	2.07	2.14
Quantile RF ntree 1500	2.13	2.2	2.16
Quantile RF ntree 500	2.12	2.2	2.16
Quantile RF ntree 1000	2.13	2.2	2.16
Nmodels RF ntree 500	2.24	2.12	2.18
Nmodels RF ntree 1500	2.24	2.12	2.18
Nmodels RF ntree 1000	2.25	2.12	2.18
Quantile SVM cost 10 gamma 0.01	2.15	2.22	2.18
Quantile SVM cost 50 gamma 0.001	2.12	2.26	2.19
Nmodels SVM cost 10 gamma 0.01	2.21	2.17	2.19
Nmodels SVM cost 50 gamma 0.001	2.27	2.13	2.2
Quantile SVM cost 5 gamma 0.01	2.23	2.3	2.27
Nmodels SVM cost 5 gamma 0.01	2.3	2.25	2.28
Nmodels QRF ntree 1500	2.1	2.48	2.29
Nmodels QRF ntree 1000	2.11	2.49	2.3
Nmodels QRF ntree 500	2.11	2.49	2.3
Iterated SVM cost 100 gamma 0.001	2.47	2.26	2.37
Quantile QRF ntree 1500	2.19	2.58	2.38
Quantile QRF ntree 500	2.19	2.59	2.39
Quantile SVM cost 1 gamma 0.05	2.35	2.43	2.39
Quantile QRF ntree 1000	2.21	2.58	2.39
Quantile SVM cost 10 gamma 0.001	2.32	2.48	2.4
Iterated SVM cost 50 gamma 0.001	2.51	2.3	2.4
Quantile SVM cost 1 gamma 0.1	2.38	2.46	2.42
Nmodels SVM cost 1 gamma 0.05	2.46	2.38	2.42

Nmodels RT se 0	2.39	2.48	2.43
Nmodels SVM cost 1 gamma 0.1	2.49	2.39	2.44
Nmodels SVM cost 10 gamma 0.001	2.55	2.35	2.45
Nmodels RT se 0.5	2.42	2.56	2.49
Iterated RT se 0	2.6	2.41	2.5
Nmodels RT se 1.5	2.43	2.59	2.51
Nmodels RT se 1	2.44	2.6	2.52
Iterated SVM cost 10 gamma 0.001	2.61	2.44	2.53
Iterated RT se 0.5	2.66	2.42	2.54
Iterated RT se 1	2.66	2.42	2.54
Iterated RT se 1.5	2.71	2.4	2.55
Iterated SVM cost 50 gamma 0.01	2.54	2.61	2.57
Quantile SVM cost 5 gamma 0.001	2.5	2.65	2.57
Iterated SVM cost 5 gamma 0.001	2.65	2.52	2.58
Quantile SVM cost 1 gamma 0.01	2.54	2.67	2.6
Iterated SVM cost 10 gamma 0.01	2.62	2.58	2.6
Nmodels SVM cost 5 gamma 0.001	2.73	2.52	2.63
Iterated SVM cost 100 gamma 0.01	2.57	2.69	2.63
Iterated QRF ntree 1000	2.59	2.67	2.63
Iterated QRF ntree 1500	2.6	2.68	2.64
Iterated QRF ntree 500	2.6	2.68	2.64
Iterated SVM cost 5 gamma 0.01	2.7	2.59	2.64
Quantile RT se 0	2.72	2.59	2.66
Nmodels SVM cost 1 gamma 0.01	2.74	2.59	2.66
Iterated RF ntree 500	2.71	2.66	2.68
Iterated RF ntree 1500	2.72	2.65	2.69
Iterated RF ntree 1000	2.72	2.66	2.69
Quantile RT se 0.5	2.8	2.71	2.75
Quantile RT se 1	2.77	2.76	2.77
Quantile RT se 1.5	2.74	2.8	2.77
Iterated SVM cost 10 gamma 0.05	2.87	2.98	2.92
Iterated SVM cost 5 gamma 0.05	2.88	2.99	2.93
Iterated SVM cost 1 gamma 0.01	2.97	2.94	2.96
Iterated SVM cost 1 gamma 0.05	2.98	2.97	2.97
Iterated SVM cost 50 gamma 0.05	2.95	3.23	3.09
Iterated SVM cost 5 gamma 0.1	3.03	3.18	3.1
Iterated SVM cost 10 gamma 0.1	3.04	3.22	3.13
Iterated SVM cost 1 gamma 0.001	3.29	3.05	3.17
Quantile SVM cost 1 gamma 0.001	3.12	3.29	3.21
Iterated SVM cost 100 gamma 0.05	3.06	3.39	3.22
Iterated SVM cost 50 gamma 0.1	3.13	3.37	3.25

Nmodels SVM cost 1 gamma 0.001	3.4	3.17	3.28
Iterated SVM cost 100 gamma 0.1	3.22	3.39	3.31
Iterated SVM cost 1 gamma 0.1	3.34	3.37	3.35
RW	10.76	12.23	11.49

Table 1.19: All setups MAQ



### 1.7.2 TQE - Total Quantile Error

Figure 1.20 shows the results using the TQE error measure for all different setups.

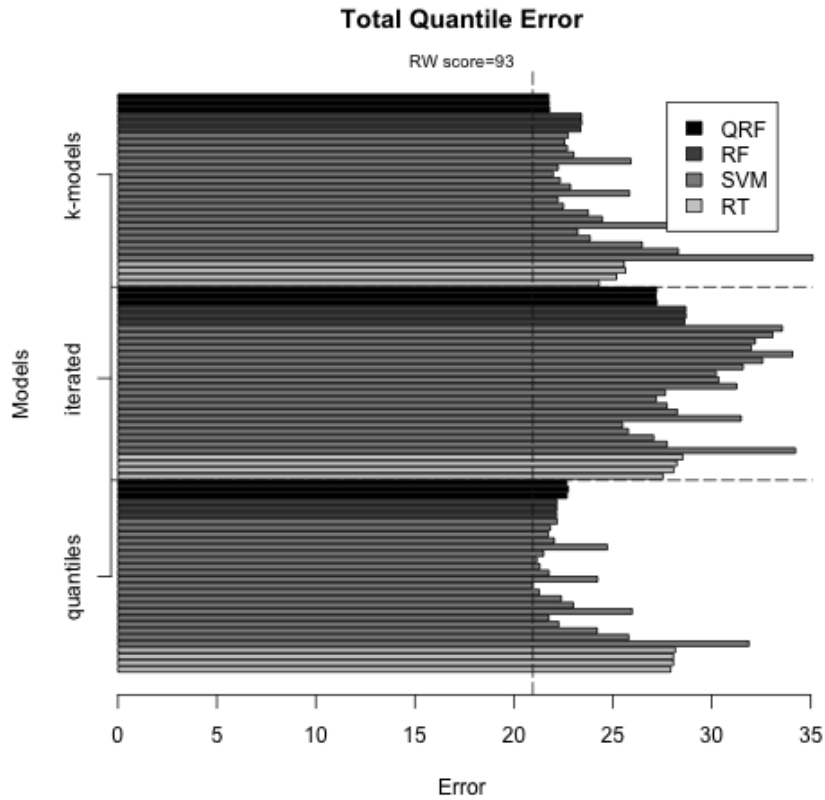


Figure 1.20: Stream 7

Table 1.20 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile SVM cost 100 gamma 0.01	10.69	10.27	20.95
Quantile SVM cost 50 gamma 0.05	10.92	10.24	21.16
Quantile SVM cost 50 gamma 0.01	10.89	10.4	21.28
Quantile SVM cost 10 gamma 0.05	11.03	10.28	21.31
Quantile SVM cost 100 gamma 0.05	11.06	10.44	21.51
Quantile SVM cost 10 gamma 0.1	11.33	10.4	21.73
Quantile SVM cost 100 gamma 0.001	11.01	10.75	21.76

Nmodels QRF ntree 1500	10.64	11.13	21.76
Quantile SVM cost 5 gamma 0.05	11.33	10.45	21.77
Nmodels QRF ntree 1000	10.65	11.13	21.78
Nmodels QRF ntree 500	10.64	11.15	21.79
Quantile SVM cost 50 gamma 0.1	11.3	10.54	21.84
Nmodels SVM cost 50 gamma 0.05	11.57	10.41	21.98
Quantile SVM cost 5 gamma 0.1	11.5	10.54	22.04
Quantile RF ntree 500	11.7	10.46	22.15
Quantile RF ntree 1000	11.71	10.46	22.16
Quantile RF ntree 1500	11.71	10.46	22.17
Quantile SVM cost 100 gamma 0.1	11.47	10.71	22.18
Nmodels SVM cost 100 gamma 0.01	11.62	10.61	22.22
Nmodels SVM cost 100 gamma 0.05	11.68	10.55	22.24
Quantile SVM cost 50 gamma 0.001	11.31	10.96	22.27
Nmodels SVM cost 10 gamma 0.05	11.85	10.48	22.33
Quantile SVM cost 10 gamma 0.01	11.49	10.91	22.4
Nmodels SVM cost 50 gamma 0.01	11.76	10.75	22.51
Nmodels SVM cost 50 gamma 0.1	11.98	10.57	22.55
Quantile QRF ntree 1500	11.18	11.49	22.68
Quantile QRF ntree 500	11.18	11.5	22.68
Nmodels SVM cost 10 gamma 0.1	12.16	10.54	22.7
Nmodels SVM cost 100 gamma 0.1	11.96	10.78	22.74
Quantile QRF ntree 1000	11.27	11.48	22.75
Nmodels SVM cost 5 gamma 0.05	12.17	10.69	22.86
Quantile SVM cost 5 gamma 0.01	11.77	11.23	23
Nmodels SVM cost 5 gamma 0.1	12.39	10.63	23.02
Nmodels SVM cost 100 gamma 0.001	12.28	10.94	23.23
Nmodels RF ntree 500	12.68	10.69	23.38
Nmodels RF ntree 1500	12.7	10.72	23.41
Nmodels RF ntree 1000	12.71	10.71	23.42
Nmodels SVM cost 10 gamma 0.01	12.38	11.38	23.75
Nmodels SVM cost 50 gamma 0.001	12.69	11.17	23.85
Quantile SVM cost 10 gamma 0.001	12.48	11.73	24.21
Quantile SVM cost 1 gamma 0.05	12.65	11.58	24.23
Nmodels RT se 0	12.93	11.38	24.31
Nmodels SVM cost 5 gamma 0.01	12.76	11.71	24.47
Quantile SVM cost 1 gamma 0.1	13.03	11.69	24.72
Nmodels RT se 0.5	13.26	11.93	25.18
Iterated SVM cost 100 gamma 0.001	13.78	11.71	25.49
Nmodels RT se 1.5	13.26	12.31	25.57
Nmodels RT se 1	13.39	12.25	25.64

Iterated SVM cost 50 gamma 0.001	13.84	11.94	25.78
Quantile SVM cost 5 gamma 0.001	13.5	12.3	25.8
Nmodels SVM cost 1 gamma 0.05	13.77	12.07	25.84
Nmodels SVM cost 1 gamma 0.1	14.04	11.87	25.91
Quantile SVM cost 1 gamma 0.01	13.38	12.59	25.98
Nmodels SVM cost 10 gamma 0.001	14.42	12.07	26.48
Iterated SVM cost 10 gamma 0.001	14.65	12.41	27.06
Iterated QRF ntree 1000	13.58	13.6	27.18
Iterated SVM cost 50 gamma 0.01	14.13	13.07	27.19
Iterated QRF ntree 1500	13.61	13.6	27.21
Iterated QRF ntree 500	13.6	13.63	27.23
Iterated RT se 0	14.56	12.97	27.53
Iterated SVM cost 100 gamma 0.01	14.37	13.28	27.65
Iterated SVM cost 10 gamma 0.01	14.48	13.26	27.74
Iterated SVM cost 5 gamma 0.001	14.98	12.77	27.74
Quantile RT se 0	15.51	12.41	27.92
Quantile RT se 0.5	15.4	12.66	28.06
Quantile RT se 1	15.05	13.01	28.06
Iterated RT se 0.5	14.98	13.09	28.08
Quantile RT se 1.5	15.01	13.14	28.16
Iterated RT se 1	15.02	13.22	28.24
Iterated SVM cost 5 gamma 0.01	14.84	13.41	28.25
Nmodels SVM cost 5 gamma 0.001	15.56	12.75	28.31
Nmodels SVM cost 1 gamma 0.01	15.18	13.15	28.33
Iterated RT se 1.5	15.27	13.26	28.53
Iterated RF ntree 500	15.11	13.51	28.63
Iterated RF ntree 1500	15.18	13.5	28.68
Iterated RF ntree 1000	15.18	13.51	28.69
Iterated SVM cost 10 gamma 0.05	15.73	14.49	30.22
Iterated SVM cost 5 gamma 0.05	15.83	14.52	30.35
Iterated SVM cost 1 gamma 0.05	16.41	14.85	31.26
Iterated SVM cost 1 gamma 0.01	16.36	15.12	31.48
Iterated SVM cost 50 gamma 0.05	16.15	15.43	31.58
Quantile SVM cost 1 gamma 0.001	17.52	14.35	31.87
Iterated SVM cost 5 gamma 0.1	16.85	15.15	31.99
Iterated SVM cost 10 gamma 0.1	16.83	15.37	32.2
Iterated SVM cost 100 gamma 0.05	16.53	16.04	32.57
Iterated SVM cost 50 gamma 0.1	17.19	15.89	33.08
Iterated SVM cost 100 gamma 0.1	17.54	16.02	33.56
Iterated SVM cost 1 gamma 0.1	17.97	16.11	34.09
Iterated SVM cost 1 gamma 0.001	19.14	15.09	34.23

Nmodels SVM cost 1 gamma 0.001	20.09	15.01	35.1
RW	47.79	45.3	93.09

Table 1.20: All setups TQE

### 1.7.3 Utility

Figure 1.21 shows the results using the Utility error measure (larger is better) for all different setups.

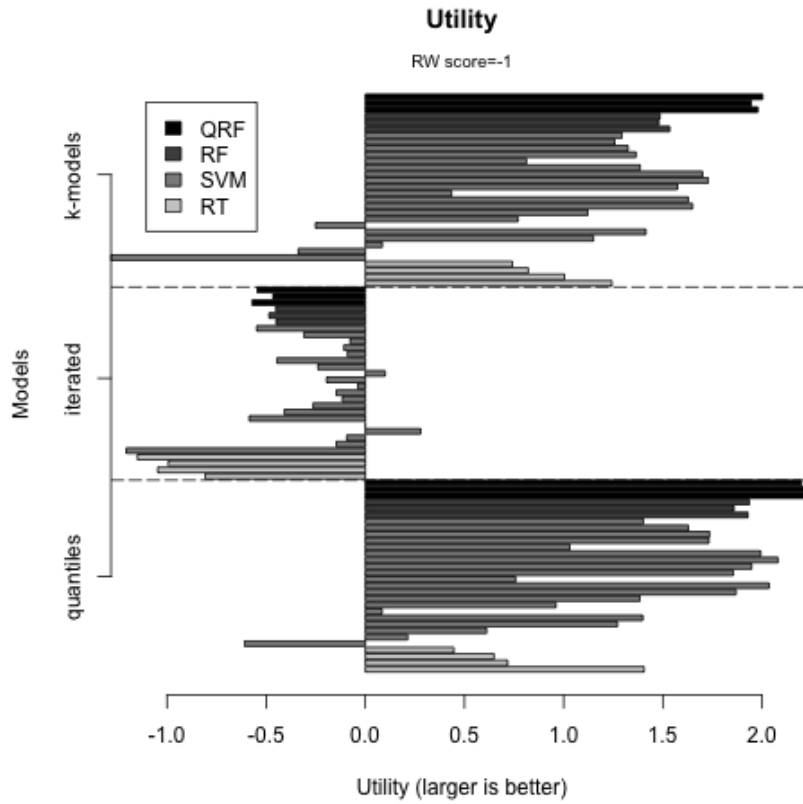


Figure 1.21: Stream 7

Table 1.21 shows all setups order by the Utility.

	utility
Quantile QRF ntree 500	2.26
Quantile QRF ntree 1000	2.22
Quantile QRF ntree 1500	2.2
Quantile SVM cost 50 gamma 0.05	2.08
Quantile SVM cost 100 gamma 0.01	2.04
Nmodels QRF ntree 1500	2
Quantile SVM cost 100 gamma 0.05	1.99

Nmodels QRF ntree 500	1.98
Quantile SVM cost 10 gamma 0.05	1.95
Nmodels QRF ntree 1000	1.95
Quantile RF ntree 1500	1.94
Quantile RF ntree 500	1.93
Quantile SVM cost 50 gamma 0.01	1.87
Quantile RF ntree 1000	1.86
Quantile SVM cost 5 gamma 0.05	1.86
Quantile SVM cost 10 gamma 0.1	1.74
Quantile SVM cost 5 gamma 0.1	1.73
Nmodels SVM cost 10 gamma 0.05	1.73
Nmodels SVM cost 50 gamma 0.05	1.7
Nmodels SVM cost 50 gamma 0.01	1.65
Quantile SVM cost 50 gamma 0.1	1.63
Nmodels SVM cost 100 gamma 0.01	1.63
Nmodels SVM cost 5 gamma 0.05	1.57
Nmodels RF ntree 500	1.53
Nmodels RF ntree 1500	1.49
Nmodels RF ntree 1000	1.48
Nmodels SVM cost 100 gamma 0.001	1.41
Quantile RT se 0	1.41
Quantile SVM cost 100 gamma 0.1	1.4
Quantile SVM cost 100 gamma 0.001	1.4
Nmodels SVM cost 100 gamma 0.05	1.39
Quantile SVM cost 10 gamma 0.01	1.38
Nmodels SVM cost 5 gamma 0.1	1.36
Nmodels SVM cost 10 gamma 0.1	1.32
Nmodels SVM cost 100 gamma 0.1	1.29
Quantile SVM cost 50 gamma 0.001	1.27
Nmodels SVM cost 50 gamma 0.1	1.26
Nmodels RT se 0	1.24
Nmodels SVM cost 50 gamma 0.001	1.15
Nmodels SVM cost 10 gamma 0.01	1.12
Quantile SVM cost 1 gamma 0.1	1.03
Nmodels RT se 0.5	1
Quantile SVM cost 5 gamma 0.01	0.96
Nmodels RT se 1	0.82
Nmodels SVM cost 1 gamma 0.1	0.81
Nmodels SVM cost 5 gamma 0.01	0.77
Quantile SVM cost 1 gamma 0.05	0.76
Nmodels RT se 1.5	0.74

Quantile RT se 0.5	0.72
Quantile RT se 1	0.65
Quantile SVM cost 10 gamma 0.001	0.61
Quantile RT se 1.5	0.45
Nmodels SVM cost 1 gamma 0.05	0.43
Iterated SVM cost 50 gamma 0.001	0.28
Quantile SVM cost 5 gamma 0.001	0.21
Iterated SVM cost 10 gamma 0.05	0.1
Nmodels SVM cost 10 gamma 0.001	0.09
Quantile SVM cost 1 gamma 0.01	0.08
Iterated SVM cost 100 gamma 0.001	0
Iterated SVM cost 1 gamma 0.05	-0.04
Iterated SVM cost 10 gamma 0.1	-0.08
Iterated SVM cost 1 gamma 0.1	-0.09
Iterated SVM cost 10 gamma 0.001	-0.09
Iterated SVM cost 5 gamma 0.1	-0.11
Iterated SVM cost 50 gamma 0.01	-0.12
Iterated SVM cost 5 gamma 0.001	-0.15
Iterated SVM cost 100 gamma 0.01	-0.15
Iterated SVM cost 5 gamma 0.05	-0.2
Iterated SVM cost 50 gamma 0.05	-0.24
Nmodels SVM cost 1 gamma 0.01	-0.25
Iterated SVM cost 10 gamma 0.01	-0.26
Iterated SVM cost 50 gamma 0.1	-0.31
Nmodels SVM cost 5 gamma 0.001	-0.34
Iterated SVM cost 5 gamma 0.01	-0.41
Iterated SVM cost 100 gamma 0.05	-0.45
Iterated RF ntree 500	-0.45
Iterated RF ntree 1500	-0.45
Iterated QRF ntree 1000	-0.47
Iterated RF ntree 1000	-0.49
Iterated QRF ntree 1500	-0.55
Iterated SVM cost 100 gamma 0.1	-0.55
Iterated QRF ntree 500	-0.57
Iterated SVM cost 1 gamma 0.01	-0.59
Quantile SVM cost 1 gamma 0.001	-0.61
Iterated RT se 0	-0.81
Iterated RT se 1	-0.99
Iterated RT se 0.5	-1.05
Iterated RT se 1.5	-1.15
Iterated SVM cost 1 gamma 0.001	-1.21

Nmodels SVM cost 1 gamma 0.001	-1.28
RW	-1.44

Table 1.21: All setups Utility



## Chapter 2

# Window Size 20

This chapter presents the results for the 7 artificial datasets (streams) for the window size of 20 values,  $k = 20$ .

### 2.1 Stream 1

#### 2.1.1 MAQ - Mean Absolute Quantile Deviation

Figure 2.1 shows the results using the MAQ error measure for all different setups.

Table 2.1 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Nmodels SVM cost 100 gamma 0.1	3.45	3.9	3.68
Quantile SVM cost 100 gamma 0.1	3.51	3.85	3.68
Quantile SVM cost 50 gamma 0.1	3.57	3.94	3.76
Nmodels SVM cost 50 gamma 0.1	3.52	4.01	3.76
Nmodels SVM cost 100 gamma 0.05	3.62	4.14	3.88
Quantile SVM cost 100 gamma 0.05	3.66	4.14	3.9
Quantile SVM cost 50 gamma 0.05	3.69	4.21	3.95
Nmodels SVM cost 50 gamma 0.05	3.68	4.24	3.96
Quantile SVM cost 10 gamma 0.1	3.78	4.27	4.02
Quantile RF ntree 1500	3.87	4.29	4.08
Quantile RF ntree 1000	3.88	4.29	4.08
Quantile RF ntree 500	3.88	4.29	4.09
Nmodels SVM cost 10 gamma 0.1	3.85	4.4	4.13
Nmodels RF ntree 1000	4.08	4.43	4.25
Nmodels RF ntree 500	4.07	4.44	4.26
Nmodels RF ntree 1500	4.07	4.44	4.26

Quantile SVM cost 5 gamma 0.1	4.01	4.53	4.27
Quantile SVM cost 10 gamma 0.05	4.01	4.53	4.27
Nmodels SVM cost 10 gamma 0.05	4.01	4.75	4.38
Nmodels SVM cost 5 gamma 0.1	4.1	4.71	4.41
Quantile SVM cost 100 gamma 0.01	4.19	4.86	4.52
Quantile SVM cost 5 gamma 0.05	4.33	4.8	4.56
Nmodels SVM cost 100 gamma 0.01	4.2	4.96	4.58
Quantile SVM cost 50 gamma 0.01	4.3	5.01	4.65
Nmodels SVM cost 5 gamma 0.05	4.29	5.04	4.66
Nmodels SVM cost 50 gamma 0.01	4.27	5.12	4.69
Nmodels QRF ntree 1000	4.14	5.56	4.85
Nmodels QRF ntree 1500	4.15	5.57	4.86
Nmodels QRF ntree 500	4.15	5.57	4.86
Nmodels RT se 0	4.6	5.17	4.88
Quantile SVM cost 10 gamma 0.01	4.58	5.32	4.95
Nmodels SVM cost 10 gamma 0.01	4.45	5.5	4.97
Quantile RT se 0	4.77	5.31	5.04
Quantile QRF ntree 1500	4.45	5.68	5.06
Quantile QRF ntree 500	4.45	5.69	5.07
Quantile QRF ntree 1000	4.49	5.69	5.09
Quantile SVM cost 5 gamma 0.01	4.8	5.55	5.17
Nmodels SVM cost 5 gamma 0.01	4.67	5.76	5.21
Nmodels RT se 0.5	4.88	5.57	5.23
Quantile SVM cost 100 gamma 0.001	4.93	5.65	5.29
Nmodels SVM cost 100 gamma 0.001	4.83	5.84	5.34
Quantile SVM cost 50 gamma 0.001	5.05	5.79	5.42
Quantile SVM cost 1 gamma 0.1	5.17	5.72	5.45
Nmodels SVM cost 50 gamma 0.001	4.97	5.97	5.47
Nmodels RT se 1	5.11	5.85	5.48
Quantile RT se 0.5	5.19	5.78	5.48
Nmodels RT se 1.5	5.24	5.89	5.56
Nmodels SVM cost 1 gamma 0.1	5.16	6.04	5.6
Quantile SVM cost 1 gamma 0.05	5.36	5.87	5.61
Quantile RT se 1	5.49	6.05	5.77
Nmodels SVM cost 1 gamma 0.05	5.42	6.16	5.79
Quantile SVM cost 10 gamma 0.001	5.55	6.18	5.87
Nmodels SVM cost 10 gamma 0.001	5.51	6.37	5.94
Quantile RT se 1.5	5.72	6.28	6
Quantile SVM cost 1 gamma 0.01	5.78	6.59	6.18
Quantile SVM cost 5 gamma 0.001	5.92	6.51	6.22
Nmodels SVM cost 1 gamma 0.01	5.76	6.8	6.28

Nmodels SVM cost 5 gamma 0.001	5.94	6.7	6.32
Iterated RT se 0.5	5.57	7.2	6.38
Iterated RT se 1	5.59	7.21	6.4
Iterated RT se 1.5	5.61	7.24	6.42
Iterated RT se 0	5.75	7.24	6.49
Iterated SVM cost 50 gamma 0.01	6.46	7.41	6.93
Iterated SVM cost 100 gamma 0.01	6.6	7.39	7
Iterated SVM cost 50 gamma 0.001	6.7	7.53	7.11
Iterated SVM cost 10 gamma 0.01	6.66	7.62	7.14
Iterated SVM cost 5 gamma 0.001	6.53	7.75	7.14
Iterated SVM cost 10 gamma 0.001	6.58	7.74	7.16
Iterated SVM cost 100 gamma 0.001	6.85	7.49	7.17
Iterated RF ntree 500	6.51	7.92	7.22
Iterated RF ntree 1000	6.51	7.93	7.22
Iterated RF ntree 1500	6.51	7.93	7.22
Iterated QRF ntree 1000	6.76	7.72	7.24
Iterated QRF ntree 500	6.77	7.74	7.25
Iterated QRF ntree 1500	6.78	7.73	7.26
Iterated SVM cost 5 gamma 0.01	6.85	7.75	7.3
Quantile SVM cost 1 gamma 0.001	7.25	7.7	7.48
Nmodels SVM cost 1 gamma 0.001	7.07	8.02	7.54
Iterated SVM cost 50 gamma 0.05	7.31	8.11	7.71
Iterated SVM cost 10 gamma 0.05	7.33	8.15	7.74
Iterated SVM cost 1 gamma 0.001	6.99	8.5	7.75
Iterated SVM cost 100 gamma 0.05	7.41	8.18	7.8
Iterated SVM cost 5 gamma 0.05	7.42	8.25	7.83
Iterated SVM cost 1 gamma 0.05	7.62	8.79	8.2
Iterated SVM cost 1 gamma 0.01	7.59	8.97	8.28
Iterated SVM cost 5 gamma 0.1	8.38	8.81	8.6
Iterated SVM cost 100 gamma 0.1	8.51	8.7	8.61
Iterated SVM cost 10 gamma 0.1	8.46	8.76	8.61
Iterated SVM cost 50 gamma 0.1	8.54	8.72	8.63
Iterated SVM cost 1 gamma 0.1	8.43	9.02	8.73
RW	41.4	26.15	33.77

Table 2.1: All setups MAQ

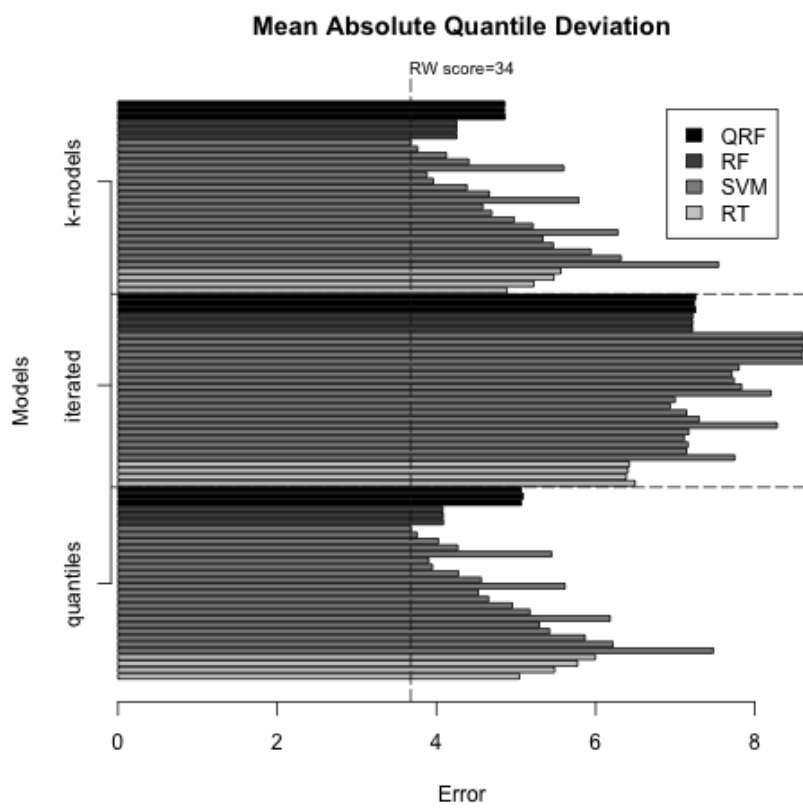


Figure 2.1: Stream 1

### 2.1.2 TQE - Total Quantile Error

Figure 2.2 shows the results using the TQE error measure for all different setups.

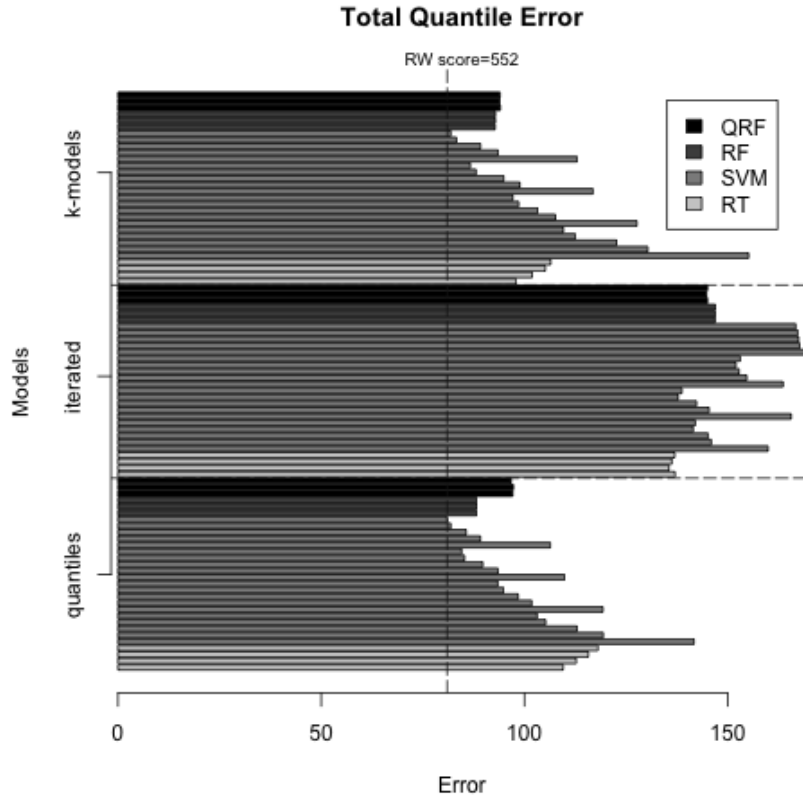


Figure 2.2: Stream 1

Table 2.2 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile SVM cost 100 gamma 0.1	39.73	41.27	81
Quantile SVM cost 50 gamma 0.1	39.98	41.9	81.87
Nmodels SVM cost 100 gamma 0.1	39.74	42.14	81.88
Nmodels SVM cost 50 gamma 0.1	40.28	42.99	83.28
Quantile SVM cost 100 gamma 0.05	40.84	43.71	84.55
Quantile SVM cost 50 gamma 0.05	40.98	44.29	85.27
Quantile SVM cost 10 gamma 0.1	41	44.67	85.67

Nmodels SVM cost 100 gamma 0.05	41.37	45.31	86.68
Nmodels SVM cost 50 gamma 0.05	41.9	46.19	88.09
Quantile RF ntree 1500	44.03	44.18	88.21
Quantile RF ntree 1000	44.07	44.14	88.21
Quantile RF ntree 500	44.04	44.19	88.22
Quantile SVM cost 5 gamma 0.1	42.3	46.87	89.17
Nmodels SVM cost 10 gamma 0.1	42.43	46.77	89.2
Quantile SVM cost 10 gamma 0.05	42.59	47.17	89.76
Nmodels RF ntree 500	46.87	45.91	92.78
Nmodels RF ntree 1000	46.94	45.91	92.85
Nmodels RF ntree 1500	46.92	45.93	92.85
Quantile SVM cost 100 gamma 0.01	42.89	50.54	93.43
Quantile SVM cost 5 gamma 0.05	44.19	49.32	93.51
Nmodels SVM cost 5 gamma 0.1	43.83	49.7	93.53
Nmodels QRF ntree 1000	42.98	50.99	93.97
Nmodels QRF ntree 1500	42.98	51.02	94
Nmodels QRF ntree 500	42.99	51.07	94.07
Quantile SVM cost 50 gamma 0.01	43.57	51.28	94.85
Nmodels SVM cost 10 gamma 0.05	43.8	51.1	94.9
Quantile QRF ntree 1500	44.74	52	96.73
Quantile QRF ntree 500	44.89	52.24	97.12
Nmodels SVM cost 100 gamma 0.01	44.61	52.54	97.15
Quantile QRF ntree 1000	44.98	52.31	97.28
Nmodels RT se 0	47.96	50	97.95
Quantile SVM cost 10 gamma 0.01	45.28	53.19	98.46
Nmodels SVM cost 50 gamma 0.01	44.96	53.63	98.59
Nmodels SVM cost 5 gamma 0.05	45.4	53.48	98.88
Quantile SVM cost 5 gamma 0.01	46.76	55.03	101.79
Nmodels RT se 0.5	49.39	52.49	101.88
Quantile SVM cost 100 gamma 0.001	47.85	55.25	103.1
Nmodels SVM cost 10 gamma 0.01	46.5	56.76	103.25
Nmodels RT se 1	50.69	54.46	105.14
Quantile SVM cost 50 gamma 0.001	48.83	56.39	105.22
Quantile SVM cost 1 gamma 0.1	49.08	57.27	106.35
Nmodels RT se 1.5	51.34	55.13	106.46
Nmodels SVM cost 5 gamma 0.01	48.42	59.21	107.63
Quantile RT se 0	54.35	55.19	109.54
Nmodels SVM cost 100 gamma 0.001	50.01	59.59	109.59
Quantile SVM cost 1 gamma 0.05	50.23	59.62	109.85
Nmodels SVM cost 50 gamma 0.001	51.66	60.84	112.5
Quantile RT se 0.5	55.53	57.2	112.73

Quantile SVM cost 10 gamma 0.001	54.07	58.85	112.92
Nmodels SVM cost 1 gamma 0.1	50.48	62.48	112.95
Quantile RT se 1	56.74	58.99	115.72
Nmodels SVM cost 1 gamma 0.05	52.51	64.33	116.84
Quantile RT se 1.5	57.3	60.77	118.07
Quantile SVM cost 1 gamma 0.01	54.36	64.96	119.31
Quantile SVM cost 5 gamma 0.001	58.09	61.3	119.39
Nmodels SVM cost 10 gamma 0.001	58.37	64.3	122.67
Nmodels SVM cost 1 gamma 0.01	57.58	70.09	127.67
Nmodels SVM cost 5 gamma 0.001	63.18	67.18	130.36
Iterated RT se 0.5	58.08	77.47	135.55
Iterated RT se 1	58.39	77.87	136.26
Iterated RT se 1.5	58.62	78.37	136.99
Iterated RT se 0	59.3	77.76	137.06
Iterated SVM cost 50 gamma 0.01	58.08	79.74	137.82
Iterated SVM cost 100 gamma 0.01	58.89	79.86	138.75
Iterated SVM cost 50 gamma 0.001	60.54	80.97	141.51
Quantile SVM cost 1 gamma 0.001	68.77	72.95	141.72
Iterated SVM cost 100 gamma 0.001	61.01	81.01	142.02
Iterated SVM cost 10 gamma 0.01	60.6	81.73	142.33
Iterated QRF ntree 1000	64.92	79.88	144.79
Iterated QRF ntree 1500	65.04	79.99	145.03
Iterated QRF ntree 500	65	80.03	145.03
Iterated SVM cost 10 gamma 0.001	62.4	82.75	145.14
Iterated SVM cost 5 gamma 0.01	61.66	83.77	145.42
Iterated SVM cost 5 gamma 0.001	63.08	82.88	145.96
Iterated RF ntree 500	67.02	79.88	146.9
Iterated RF ntree 1000	66.96	79.96	146.93
Iterated RF ntree 1500	67.04	79.92	146.97
Iterated SVM cost 50 gamma 0.05	62.97	89.06	152.02
Iterated SVM cost 10 gamma 0.05	63.27	89.53	152.8
Iterated SVM cost 100 gamma 0.05	63.56	89.51	153.07
Iterated SVM cost 5 gamma 0.05	64.43	90.27	154.7
Nmodels SVM cost 1 gamma 0.001	72.8	82.37	155.17
Iterated SVM cost 1 gamma 0.001	67.69	92.25	159.94
Iterated SVM cost 1 gamma 0.05	66.76	96.86	163.62
Iterated SVM cost 1 gamma 0.01	66.81	98.82	165.63
Iterated SVM cost 100 gamma 0.1	70.42	96.32	166.74
Iterated SVM cost 50 gamma 0.1	70.54	96.68	167.22
Iterated SVM cost 10 gamma 0.1	70.16	97.3	167.46
Iterated SVM cost 5 gamma 0.1	70.17	97.52	167.69

Iterated SVM cost 1 gamma 0.1	69.98	100.94	170.92
RW	244.95	307.19	552.14

Table 2.2: All setups TQE



### 2.1.3 Utility

Figure 2.3 shows the results using the Utility error measure (larger is better) for all different setups.

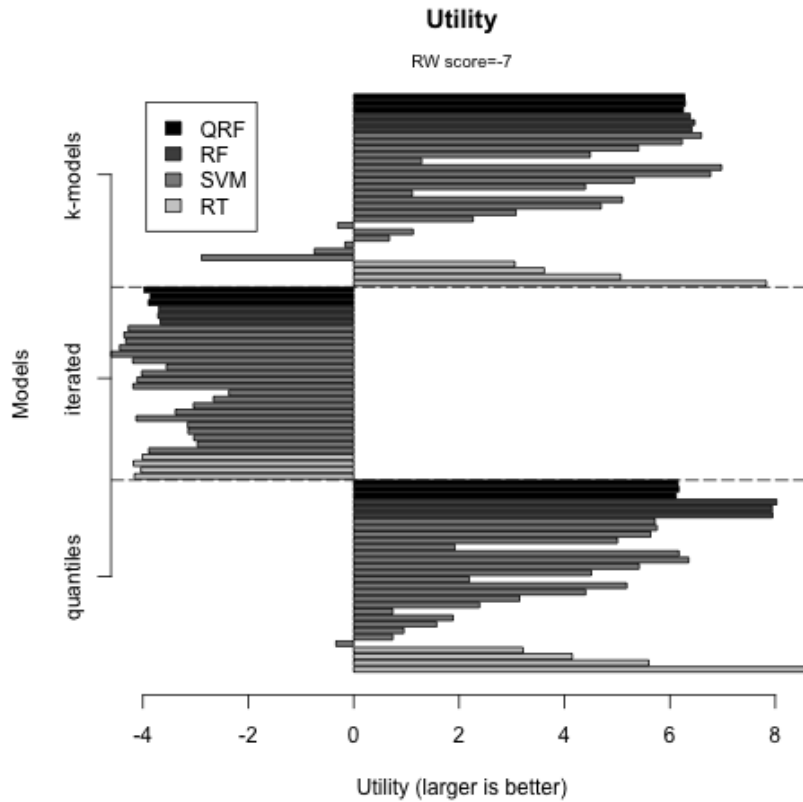


Figure 2.3: Stream 1

Table 2.3 shows all setups order by the Utility.

	utility
Quantile RT se 0	8.71
Quantile RF ntree 1500	8.02
Quantile RF ntree 500	7.95
Quantile RF ntree 1000	7.94
Nmodels RT se 0	7.83
Nmodels SVM cost 100 gamma 0.05	6.98
Nmodels SVM cost 50 gamma 0.05	6.77

Nmodels SVM cost 100 gamma 0.1	6.6
Nmodels RF ntree 1000	6.47
Nmodels RF ntree 500	6.42
Nmodels RF ntree 1500	6.38
Quantile SVM cost 50 gamma 0.05	6.36
Nmodels QRF ntree 1000	6.29
Nmodels QRF ntree 1500	6.29
Nmodels QRF ntree 500	6.26
Nmodels SVM cost 50 gamma 0.1	6.23
Quantile SVM cost 100 gamma 0.05	6.17
Quantile QRF ntree 1000	6.17
Quantile QRF ntree 1500	6.15
Quantile QRF ntree 500	6.12
Quantile SVM cost 50 gamma 0.1	5.76
Quantile SVM cost 100 gamma 0.1	5.72
Quantile SVM cost 10 gamma 0.1	5.64
Quantile RT se 0.5	5.6
Quantile SVM cost 10 gamma 0.05	5.42
Nmodels SVM cost 10 gamma 0.1	5.4
Nmodels SVM cost 10 gamma 0.05	5.32
Quantile SVM cost 100 gamma 0.01	5.18
Nmodels SVM cost 100 gamma 0.01	5.1
Nmodels RT se 0.5	5.07
Quantile SVM cost 5 gamma 0.1	5.01
Nmodels SVM cost 50 gamma 0.01	4.7
Quantile SVM cost 5 gamma 0.05	4.51
Nmodels SVM cost 5 gamma 0.1	4.49
Quantile SVM cost 50 gamma 0.01	4.4
Nmodels SVM cost 5 gamma 0.05	4.4
Quantile RT se 1	4.15
Nmodels RT se 1	3.62
Quantile RT se 1.5	3.21
Quantile SVM cost 10 gamma 0.01	3.15
Nmodels SVM cost 10 gamma 0.01	3.08
Nmodels RT se 1.5	3.06
Quantile SVM cost 5 gamma 0.01	2.39
Nmodels SVM cost 5 gamma 0.01	2.27
Quantile SVM cost 1 gamma 0.05	2.19
Quantile SVM cost 1 gamma 0.1	1.92
Quantile SVM cost 100 gamma 0.001	1.89
Quantile SVM cost 50 gamma 0.001	1.57

Nmodels SVM cost 1 gamma 0.1	1.29
Nmodels SVM cost 100 gamma 0.001	1.13
Nmodels SVM cost 1 gamma 0.05	1.11
Quantile SVM cost 10 gamma 0.001	0.95
Quantile SVM cost 5 gamma 0.001	0.74
Quantile SVM cost 1 gamma 0.01	0.74
Nmodels SVM cost 50 gamma 0.001	0.68
Nmodels SVM cost 10 gamma 0.001	-0.16
Nmodels SVM cost 1 gamma 0.01	-0.3
Quantile SVM cost 1 gamma 0.001	-0.33
Nmodels SVM cost 5 gamma 0.001	-0.74
Iterated SVM cost 100 gamma 0.01	-2.37
Iterated SVM cost 50 gamma 0.01	-2.66
Nmodels SVM cost 1 gamma 0.001	-2.88
Iterated SVM cost 5 gamma 0.001	-2.97
Iterated SVM cost 10 gamma 0.001	-3.03
Iterated SVM cost 10 gamma 0.01	-3.04
Iterated SVM cost 50 gamma 0.001	-3.14
Iterated SVM cost 100 gamma 0.001	-3.15
Iterated SVM cost 5 gamma 0.01	-3.38
Iterated SVM cost 50 gamma 0.05	-3.55
Iterated RF ntree 500	-3.67
Iterated RF ntree 1500	-3.7
Iterated RF ntree 1000	-3.71
Iterated QRF ntree 1000	-3.86
Iterated SVM cost 1 gamma 0.001	-3.89
Iterated QRF ntree 500	-3.89
Iterated QRF ntree 1500	-3.98
Iterated RT se 1.5	-4.01
Iterated SVM cost 10 gamma 0.05	-4.02
Iterated RT se 0.5	-4.04
Iterated SVM cost 5 gamma 0.05	-4.11
Iterated SVM cost 1 gamma 0.01	-4.13
Iterated RT se 0	-4.16
Iterated RT se 1	-4.18
Iterated SVM cost 1 gamma 0.05	-4.19
Iterated SVM cost 100 gamma 0.05	-4.19
Iterated SVM cost 100 gamma 0.1	-4.27
Iterated SVM cost 10 gamma 0.1	-4.32
Iterated SVM cost 50 gamma 0.1	-4.36
Iterated SVM cost 5 gamma 0.1	-4.44

Iterated SVM cost 1 gamma 0.1	-4.6
RW	-7.19

Table 2.3: All setups Utility

## 2.2 Stream 2

### 2.2.1 MAQ - Mean Absolute Quantile Deviation

Figure 2.4 shows the results using the MAQ error measure for all different setups.

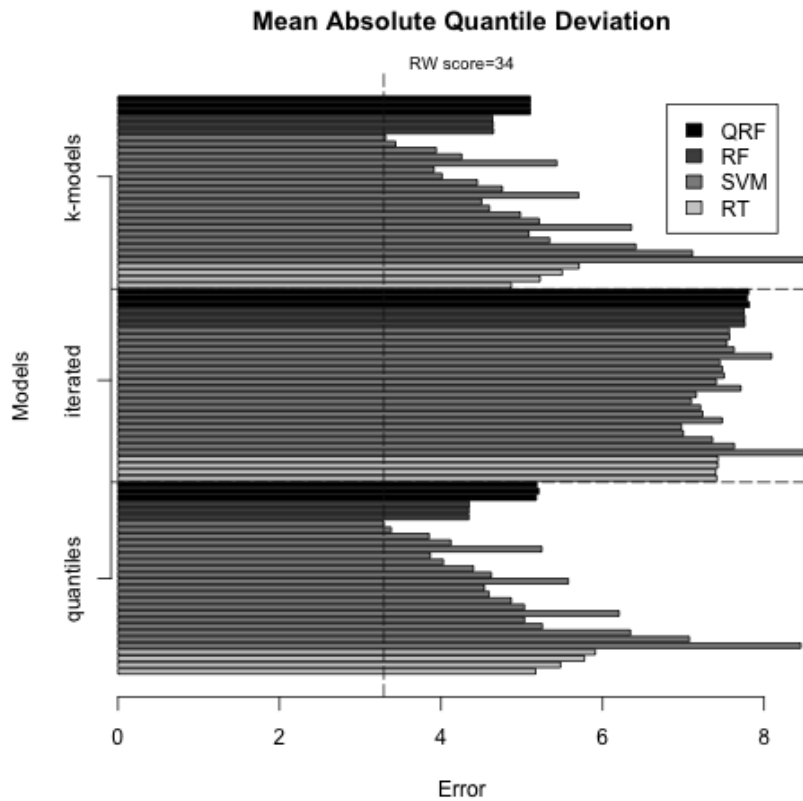


Figure 2.4: Stream 2

Table 2.4 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile SVM cost 100 gamma 0.1	3.32	3.26	3.29
Nmodels SVM cost 100 gamma 0.1	3.34	3.29	3.31
Quantile SVM cost 50 gamma 0.1	3.44	3.32	3.38
Nmodels SVM cost 50 gamma 0.1	3.49	3.39	3.44
Quantile SVM cost 10 gamma 0.1	3.94	3.76	3.85

Quantile SVM cost 100 gamma 0.05	4.12	3.61	3.87
Nmodels SVM cost 100 gamma 0.05	3.92	3.91	3.91
Nmodels SVM cost 10 gamma 0.1	4.09	3.8	3.94
Nmodels SVM cost 50 gamma 0.05	4.11	3.92	4.01
Quantile SVM cost 50 gamma 0.05	4.27	3.78	4.03
Quantile SVM cost 5 gamma 0.1	4.28	3.96	4.12
Nmodels SVM cost 5 gamma 0.1	4.48	4.03	4.26
Quantile RF ntree 1000	4.54	4.15	4.34
Quantile RF ntree 500	4.55	4.14	4.34
Quantile RF ntree 1500	4.55	4.15	4.35
Quantile SVM cost 10 gamma 0.05	4.59	4.21	4.4
Nmodels SVM cost 10 gamma 0.05	4.85	4.05	4.45
Nmodels SVM cost 100 gamma 0.01	4.99	4.01	4.5
Quantile SVM cost 100 gamma 0.01	4.77	4.31	4.54
Quantile SVM cost 50 gamma 0.01	4.78	4.41	4.6
Nmodels SVM cost 50 gamma 0.01	5.11	4.09	4.6
Quantile SVM cost 5 gamma 0.05	4.82	4.42	4.62
Nmodels RF ntree 1500	4.89	4.39	4.64
Nmodels RF ntree 1000	4.89	4.4	4.64
Nmodels RF ntree 500	4.9	4.4	4.65
Nmodels SVM cost 5 gamma 0.05	5.22	4.29	4.76
Quantile SVM cost 10 gamma 0.01	5.02	4.72	4.87
Nmodels RT se 0	4.98	4.76	4.87
Nmodels SVM cost 10 gamma 0.01	5.48	4.48	4.98
Quantile SVM cost 5 gamma 0.01	5.19	4.88	5.03
Quantile SVM cost 100 gamma 0.001	5.25	4.81	5.03
Nmodels SVM cost 100 gamma 0.001	5.24	4.93	5.09
Nmodels QRF ntree 1000	5.06	5.15	5.1
Nmodels QRF ntree 1500	5.06	5.15	5.1
Nmodels QRF ntree 500	5.06	5.15	5.11
Quantile RT se 0	5.38	4.97	5.17
Quantile QRF ntree 500	5.09	5.27	5.18
Quantile QRF ntree 1500	5.1	5.27	5.19
Quantile QRF ntree 1000	5.12	5.3	5.21
Nmodels SVM cost 5 gamma 0.01	5.63	4.8	5.22
Nmodels RT se 0.5	5.43	5.02	5.23
Quantile SVM cost 1 gamma 0.1	5.46	5.03	5.25
Quantile SVM cost 50 gamma 0.001	5.51	5	5.25
Nmodels SVM cost 50 gamma 0.001	5.53	5.16	5.34
Nmodels SVM cost 1 gamma 0.1	5.89	4.98	5.43
Quantile RT se 0.5	5.7	5.25	5.48

Nmodels RT se 1	5.75	5.25	5.5
Quantile SVM cost 1 gamma 0.05	5.76	5.39	5.57
Nmodels SVM cost 1 gamma 0.05	6.2	5.21	5.7
Nmodels RT se 1.5	5.91	5.5	5.71
Quantile RT se 1	6.03	5.52	5.77
Quantile RT se 1.5	6.24	5.58	5.91
Quantile SVM cost 1 gamma 0.01	6.45	5.96	6.2
Quantile SVM cost 10 gamma 0.001	6.63	6.06	6.34
Nmodels SVM cost 1 gamma 0.01	6.69	6.03	6.36
Nmodels SVM cost 10 gamma 0.001	6.8	6.02	6.41
Iterated SVM cost 100 gamma 0.001	7.48	6.48	6.98
Iterated SVM cost 50 gamma 0.001	7.43	6.57	7
Quantile SVM cost 5 gamma 0.001	7.34	6.81	7.07
Iterated SVM cost 50 gamma 0.01	7.32	6.88	7.1
Nmodels SVM cost 5 gamma 0.001	7.56	6.67	7.11
Iterated SVM cost 100 gamma 0.01	7.44	6.88	7.16
Iterated SVM cost 10 gamma 0.01	7.59	6.84	7.21
Iterated SVM cost 5 gamma 0.01	7.56	6.92	7.24
Iterated SVM cost 10 gamma 0.001	7.77	6.95	7.36
Iterated RT se 0.5	7.84	6.96	7.4
Iterated SVM cost 5 gamma 0.05	7.71	7.11	7.41
Iterated RT se 0	7.8	7.03	7.41
Iterated RT se 1	7.88	6.97	7.43
Iterated RT se 1.5	7.88	6.98	7.43
Iterated SVM cost 100 gamma 0.05	7.54	7.36	7.45
Iterated SVM cost 1 gamma 0.01	7.95	7.01	7.48
Iterated SVM cost 50 gamma 0.05	7.59	7.38	7.48
Iterated SVM cost 10 gamma 0.05	7.75	7.26	7.51
Iterated SVM cost 10 gamma 0.1	7.62	7.46	7.54
Iterated SVM cost 100 gamma 0.1	7.56	7.58	7.57
Iterated SVM cost 50 gamma 0.1	7.56	7.58	7.57
Iterated SVM cost 5 gamma 0.1	7.73	7.53	7.63
Iterated SVM cost 5 gamma 0.001	8.12	7.15	7.63
Iterated SVM cost 1 gamma 0.05	8.05	7.37	7.71
Iterated RF ntree 1500	7.94	7.56	7.75
Iterated RF ntree 1000	7.95	7.58	7.76
Iterated RF ntree 500	7.95	7.58	7.76
Iterated QRF ntree 1000	8.14	7.44	7.79
Iterated QRF ntree 1500	8.16	7.46	7.81
Iterated QRF ntree 500	8.16	7.47	7.82
Iterated SVM cost 1 gamma 0.1	8.18	8	8.09

Quantile SVM cost 1 gamma 0.001	8.67	8.24	8.45
Nmodels SVM cost 1 gamma 0.001	9.13	7.99	8.56
Iterated SVM cost 1 gamma 0.001	9.3	7.9	8.6
RW	23.07	45.33	34.2

Table 2.4: All setups MAQ



## 2.2.2 TQE - Total Quantile Error

Figure 2.5 shows the results using the TQE error measure for all different setups.

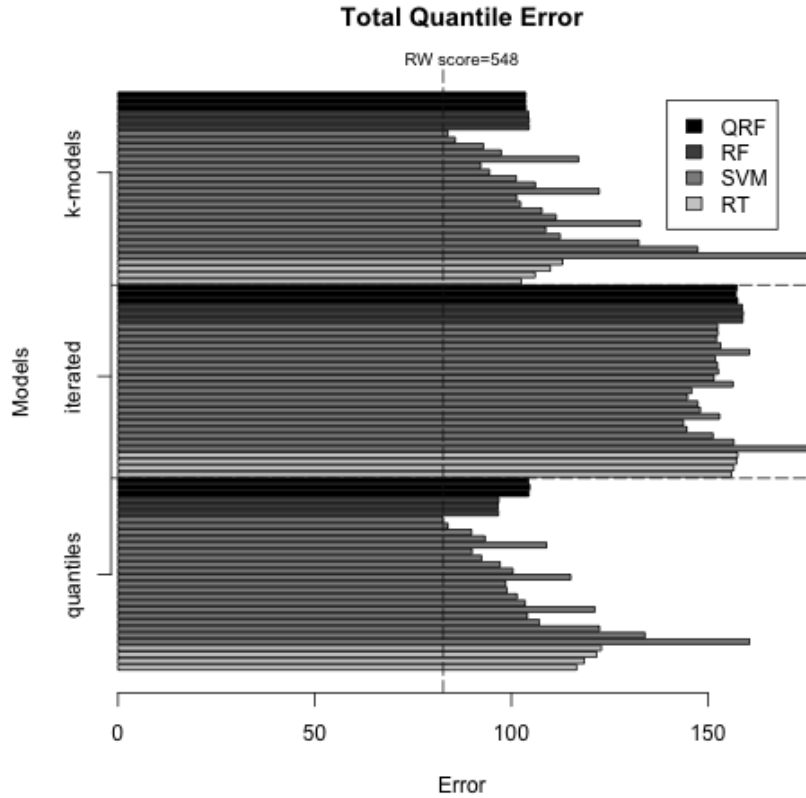


Figure 2.5: Stream 2

Table 2.5 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile SVM cost 100 gamma 0.1	41.67	40.97	82.63
Nmodels SVM cost 100 gamma 0.1	42.59	41.26	83.86
Quantile SVM cost 50 gamma 0.1	42.61	41.26	83.86
Nmodels SVM cost 50 gamma 0.1	43.75	41.98	85.73
Quantile SVM cost 10 gamma 0.1	47.05	42.81	89.87
Quantile SVM cost 100 gamma 0.05	47.24	42.75	90
Nmodels SVM cost 100 gamma 0.05	47.38	44.85	92.23

Quantile SVM cost 50 gamma 0.05	48.79	43.63	92.42
Nmodels SVM cost 10 gamma 0.1	48.95	43.94	92.89
Quantile SVM cost 5 gamma 0.1	49.79	43.51	93.3
Nmodels SVM cost 50 gamma 0.05	49.25	45.17	94.42
Quantile RF ntree 1000	50.58	46.03	96.61
Quantile RF ntree 500	50.65	46.02	96.67
Quantile RF ntree 1500	50.73	46.06	96.79
Quantile SVM cost 10 gamma 0.05	52.26	44.85	97.11
Nmodels SVM cost 5 gamma 0.1	52.45	44.96	97.41
Quantile SVM cost 100 gamma 0.01	53.03	45.5	98.52
Quantile SVM cost 50 gamma 0.01	52.89	45.97	98.86
Quantile SVM cost 5 gamma 0.05	54.2	46.17	100.37
Nmodels SVM cost 10 gamma 0.05	55.57	45.63	101.21
Nmodels SVM cost 100 gamma 0.01	56.21	45.15	101.36
Quantile SVM cost 10 gamma 0.01	53.81	47.65	101.45
Nmodels SVM cost 50 gamma 0.01	56.96	45.36	102.32
Nmodels RT se 0	51.47	51.01	102.48
Quantile SVM cost 5 gamma 0.01	54.74	48.74	103.49
Nmodels QRF ntree 1000	52.59	51.03	103.62
Nmodels QRF ntree 1500	52.62	51.02	103.63
Nmodels QRF ntree 500	52.66	51.02	103.68
Quantile SVM cost 100 gamma 0.001	55.35	48.7	104.06
Quantile QRF ntree 1500	52.77	51.55	104.32
Nmodels RF ntree 1500	54.64	49.74	104.38
Quantile QRF ntree 500	52.87	51.55	104.42
Nmodels RF ntree 1000	54.67	49.78	104.45
Nmodels RF ntree 500	54.7	49.76	104.46
Quantile QRF ntree 1000	52.91	51.74	104.65
Nmodels RT se 0.5	53.65	52.38	106.03
Nmodels SVM cost 5 gamma 0.05	59.12	46.95	106.07
Quantile SVM cost 50 gamma 0.001	56.99	50.12	107.11
Nmodels SVM cost 10 gamma 0.01	59.56	48.18	107.74
Nmodels SVM cost 100 gamma 0.001	56.71	52.01	108.72
Quantile SVM cost 1 gamma 0.1	59.57	49.34	108.91
Nmodels RT se 1	55.77	54.11	109.87
Nmodels SVM cost 5 gamma 0.01	60.63	50.71	111.34
Nmodels SVM cost 50 gamma 0.001	58.69	53.69	112.38
Nmodels RT se 1.5	56.97	56.02	112.99
Quantile SVM cost 1 gamma 0.05	62.35	52.73	115.08
Quantile RT se 0	59.02	57.56	116.58
Nmodels SVM cost 1 gamma 0.1	65.57	51.5	117.07

Quantile RT se 0.5	60.55	57.98	118.54
Quantile SVM cost 1 gamma 0.01	63.79	57.4	121.19
Quantile RT se 1	62.63	59.02	121.65
Nmodels SVM cost 1 gamma 0.05	68.71	53.59	122.31
Quantile SVM cost 10 gamma 0.001	64.15	58.23	122.38
Quantile RT se 1.5	64.42	58.42	122.84
Nmodels SVM cost 10 gamma 0.001	69.55	62.83	132.38
Nmodels SVM cost 1 gamma 0.01	70.63	62.22	132.85
Quantile SVM cost 5 gamma 0.001	69.22	64.71	133.93
Iterated SVM cost 100 gamma 0.001	80.91	62.81	143.73
Iterated SVM cost 50 gamma 0.001	80.4	64.17	144.57
Iterated SVM cost 50 gamma 0.01	79.38	65.37	144.75
Iterated SVM cost 100 gamma 0.01	80.64	65.17	145.81
Nmodels SVM cost 5 gamma 0.001	77.96	69.37	147.33
Iterated SVM cost 10 gamma 0.01	80.49	66.87	147.37
Iterated SVM cost 5 gamma 0.01	79.85	68.15	148
Iterated SVM cost 10 gamma 0.001	82.78	68.46	151.24
Iterated SVM cost 5 gamma 0.05	83.85	67.62	151.47
Iterated SVM cost 100 gamma 0.05	82.8	69.02	151.82
Iterated SVM cost 10 gamma 0.1	83.51	68.6	152.11
Iterated SVM cost 50 gamma 0.05	83.33	69.02	152.35
Iterated SVM cost 100 gamma 0.1	83.42	69.01	152.43
Iterated SVM cost 50 gamma 0.1	83.46	69.03	152.49
Iterated SVM cost 10 gamma 0.05	84.51	68.09	152.6
Iterated SVM cost 1 gamma 0.01	84.1	68.82	152.92
Iterated SVM cost 5 gamma 0.1	83.82	69.39	153.2
Iterated RT se 0	82.07	73.82	155.89
Iterated SVM cost 1 gamma 0.05	88.2	68.11	156.31
Iterated RT se 0.5	82.83	73.67	156.5
Iterated SVM cost 5 gamma 0.001	85.68	70.83	156.51
Iterated QRF ntree 1000	80.85	76.23	157.08
Iterated RT se 1	83.36	73.86	157.22
Iterated QRF ntree 1500	81	76.35	157.35
Iterated QRF ntree 500	81.08	76.42	157.5
Iterated RT se 1.5	83.41	74.09	157.5
Iterated RF ntree 1500	81.03	77.62	158.65
Iterated RF ntree 500	81.01	77.77	158.78
Iterated RF ntree 1000	81.17	77.72	158.89
Iterated SVM cost 1 gamma 0.1	88.91	71.58	160.49
Quantile SVM cost 1 gamma 0.001	86.24	74.27	160.51
Nmodels SVM cost 1 gamma 0.001	98.42	78.09	176.51

Iterated SVM cost 1 gamma 0.001	100.16	76.41	176.57
RW	291.35	256.76	548.12

Table 2.5: All setups TQE

### 2.2.3 Utility

Figure 2.6 shows the results using the Utility error measure (larger is better) for all different setups.

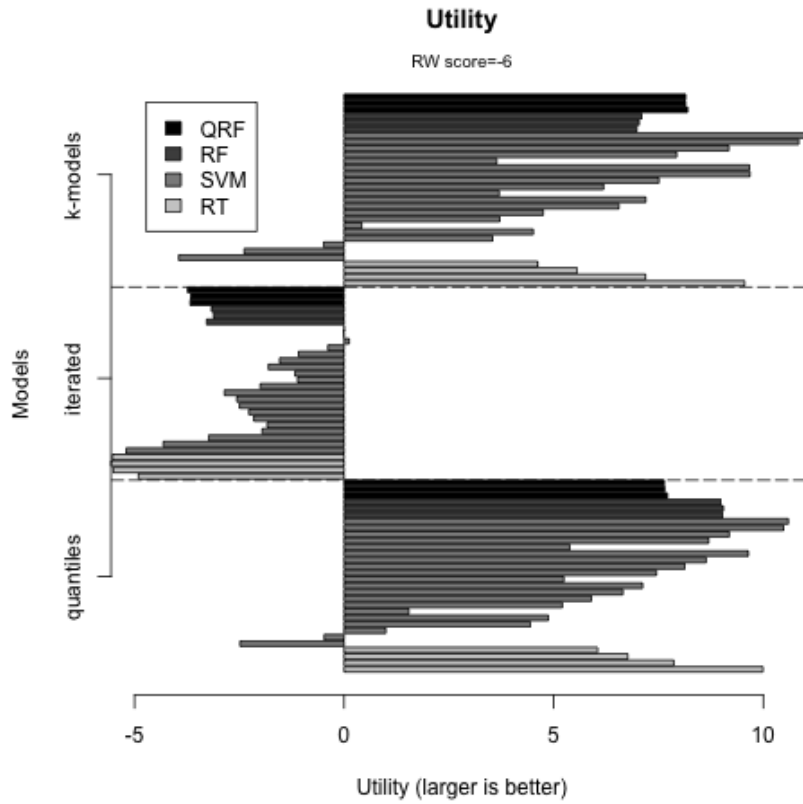


Figure 2.6: Stream 2

Table 2.6 shows all setups order by the Utility.

	utility
Nmodels SVM cost 100 gamma 0.1	11.18
Nmodels SVM cost 50 gamma 0.1	10.85
Quantile SVM cost 100 gamma 0.1	10.6
Quantile SVM cost 50 gamma 0.1	10.49
Quantile RT se 0	9.99
Nmodels SVM cost 50 gamma 0.05	9.68
Nmodels SVM cost 100 gamma 0.05	9.67

Quantile SVM cost 100 gamma 0.05	9.64
Nmodels RT se 0	9.55
Quantile SVM cost 10 gamma 0.1	9.19
Nmodels SVM cost 10 gamma 0.1	9.18
Quantile RF ntree 1000	9.05
Quantile RF ntree 500	9.03
Quantile RF ntree 1500	8.99
Quantile SVM cost 5 gamma 0.1	8.7
Quantile SVM cost 50 gamma 0.05	8.63
Nmodels QRF ntree 500	8.19
Nmodels QRF ntree 1500	8.15
Nmodels QRF ntree 1000	8.15
Quantile SVM cost 10 gamma 0.05	8.13
Nmodels SVM cost 5 gamma 0.1	7.93
Quantile RT se 0.5	7.86
Quantile QRF ntree 500	7.71
Quantile QRF ntree 1000	7.65
Quantile QRF ntree 1500	7.64
Nmodels SVM cost 10 gamma 0.05	7.51
Quantile SVM cost 5 gamma 0.05	7.45
Nmodels SVM cost 100 gamma 0.01	7.2
Nmodels RT se 0.5	7.19
Quantile SVM cost 100 gamma 0.01	7.12
Nmodels RF ntree 1500	7.1
Nmodels RF ntree 1000	7.04
Nmodels RF ntree 500	6.98
Quantile RT se 1	6.77
Quantile SVM cost 50 gamma 0.01	6.65
Nmodels SVM cost 50 gamma 0.01	6.55
Nmodels SVM cost 5 gamma 0.05	6.19
Quantile RT se 1.5	6.05
Quantile SVM cost 10 gamma 0.01	5.9
Nmodels RT se 1	5.56
Quantile SVM cost 1 gamma 0.1	5.38
Quantile SVM cost 1 gamma 0.05	5.24
Quantile SVM cost 5 gamma 0.01	5.21
Quantile SVM cost 100 gamma 0.001	4.87
Nmodels SVM cost 10 gamma 0.01	4.75
Nmodels RT se 1.5	4.62
Nmodels SVM cost 100 gamma 0.001	4.51
Quantile SVM cost 50 gamma 0.001	4.44

Nmodels SVM cost 5 gamma 0.01	3.71
Nmodels SVM cost 1 gamma 0.05	3.7
Nmodels SVM cost 1 gamma 0.1	3.64
Nmodels SVM cost 50 gamma 0.001	3.54
Quantile SVM cost 1 gamma 0.01	1.54
Quantile SVM cost 10 gamma 0.001	1
Nmodels SVM cost 1 gamma 0.01	0.42
Iterated SVM cost 10 gamma 0.1	0.12
Iterated SVM cost 100 gamma 0.1	0
Iterated SVM cost 50 gamma 0.1	-0.01
Iterated SVM cost 5 gamma 0.1	-0.39
Quantile SVM cost 5 gamma 0.001	-0.47
Nmodels SVM cost 10 gamma 0.001	-0.49
Iterated SVM cost 1 gamma 0.1	-1.09
Iterated SVM cost 5 gamma 0.05	-1.11
Iterated SVM cost 10 gamma 0.05	-1.17
Iterated SVM cost 100 gamma 0.05	-1.54
Iterated SVM cost 50 gamma 0.05	-1.81
Iterated SVM cost 100 gamma 0.001	-1.84
Iterated SVM cost 50 gamma 0.001	-1.95
Iterated SVM cost 1 gamma 0.05	-2
Iterated SVM cost 1 gamma 0.01	-2.15
Iterated SVM cost 5 gamma 0.01	-2.27
Nmodels SVM cost 5 gamma 0.001	-2.38
Quantile SVM cost 1 gamma 0.001	-2.48
Iterated SVM cost 10 gamma 0.01	-2.49
Iterated SVM cost 50 gamma 0.01	-2.56
Iterated SVM cost 100 gamma 0.01	-2.85
Iterated RF ntree 1000	-3.11
Iterated RF ntree 1500	-3.16
Iterated SVM cost 10 gamma 0.001	-3.23
Iterated RF ntree 500	-3.28
Iterated QRF ntree 1000	-3.66
Iterated QRF ntree 500	-3.67
Iterated QRF ntree 1500	-3.73
Nmodels SVM cost 1 gamma 0.001	-3.94
Iterated SVM cost 5 gamma 0.001	-4.31
Iterated RT se 0	-4.9
Iterated SVM cost 1 gamma 0.001	-5.2
Iterated RT se 0.5	-5.5
Iterated RT se 1.5	-5.53

RW	-5.53
Iterated RT se 1	-5.56

Table 2.6: All setups Utility



## 2.3 Stream 3

### 2.3.1 MAQ - Mean Absolute Quantile Deviation

Figure 2.7 shows the results using the MAQ error measure for all different setups.

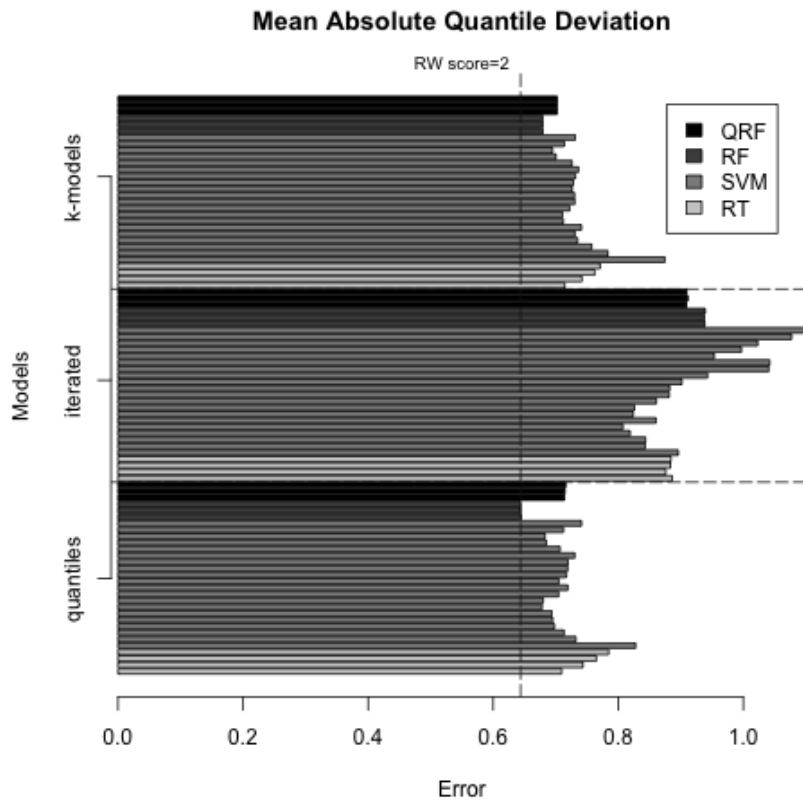


Figure 2.7: Stream 3

Table 2.7 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile RF ntree 1000	0.6	0.69	0.64
Quantile RF ntree 1500	0.6	0.69	0.64
Quantile RF ntree 500	0.6	0.69	0.64
Quantile SVM cost 5 gamma 0.01	0.61	0.75	0.68
Nmodels RF ntree 1500	0.62	0.73	0.68

Nmodels RF ntree 1000	0.62	0.73	0.68
Nmodels RF ntree 500	0.62	0.74	0.68
Quantile SVM cost 10 gamma 0.01	0.61	0.75	0.68
Quantile SVM cost 10 gamma 0.1	0.62	0.74	0.68
Quantile SVM cost 5 gamma 0.1	0.63	0.74	0.68
Quantile SVM cost 1 gamma 0.01	0.63	0.76	0.69
Nmodels SVM cost 10 gamma 0.1	0.64	0.75	0.7
Quantile SVM cost 100 gamma 0.001	0.63	0.76	0.7
Quantile SVM cost 50 gamma 0.001	0.64	0.76	0.7
Nmodels SVM cost 5 gamma 0.1	0.64	0.76	0.7
Nmodels QRF ntree 500	0.65	0.76	0.7
Nmodels QRF ntree 1500	0.65	0.76	0.7
Nmodels QRF ntree 1000	0.65	0.75	0.7
Quantile SVM cost 50 gamma 0.01	0.64	0.77	0.7
Quantile SVM cost 1 gamma 0.05	0.64	0.77	0.7
Quantile SVM cost 1 gamma 0.1	0.64	0.77	0.71
Quantile RT se 0	0.65	0.77	0.71
Nmodels SVM cost 10 gamma 0.01	0.66	0.76	0.71
Nmodels SVM cost 5 gamma 0.01	0.66	0.76	0.71
Quantile SVM cost 50 gamma 0.1	0.66	0.77	0.71
Quantile SVM cost 10 gamma 0.001	0.65	0.77	0.71
Nmodels SVM cost 50 gamma 0.1	0.67	0.76	0.71
Quantile QRF ntree 500	0.64	0.79	0.71
Nmodels RT se 0	0.64	0.78	0.71
Quantile QRF ntree 1000	0.64	0.79	0.71
Quantile QRF ntree 1500	0.64	0.79	0.72
Quantile SVM cost 5 gamma 0.05	0.65	0.78	0.72
Quantile SVM cost 10 gamma 0.05	0.66	0.78	0.72
Quantile SVM cost 100 gamma 0.01	0.66	0.78	0.72
Quantile SVM cost 50 gamma 0.05	0.67	0.77	0.72
Nmodels SVM cost 50 gamma 0.01	0.66	0.78	0.72
Nmodels SVM cost 1 gamma 0.1	0.65	0.8	0.73
Nmodels SVM cost 5 gamma 0.05	0.66	0.79	0.73
Nmodels SVM cost 10 gamma 0.05	0.66	0.8	0.73
Nmodels SVM cost 1 gamma 0.05	0.67	0.79	0.73
Quantile SVM cost 100 gamma 0.05	0.68	0.78	0.73
Nmodels SVM cost 100 gamma 0.01	0.67	0.79	0.73
Nmodels SVM cost 100 gamma 0.001	0.68	0.78	0.73
Nmodels SVM cost 100 gamma 0.1	0.69	0.77	0.73
Nmodels SVM cost 50 gamma 0.05	0.68	0.78	0.73
Quantile SVM cost 5 gamma 0.001	0.68	0.79	0.73

Nmodels SVM cost 50 gamma 0.001	0.69	0.78	0.74
Nmodels SVM cost 100 gamma 0.05	0.69	0.78	0.74
Nmodels SVM cost 1 gamma 0.01	0.69	0.8	0.74
Quantile SVM cost 100 gamma 0.1	0.69	0.79	0.74
Nmodels RT se 0.5	0.68	0.81	0.74
Quantile RT se 0.5	0.68	0.81	0.74
Nmodels SVM cost 10 gamma 0.001	0.71	0.8	0.76
Nmodels RT se 1	0.69	0.83	0.76
Quantile RT se 1	0.69	0.84	0.77
Nmodels RT se 1.5	0.7	0.84	0.77
Nmodels SVM cost 5 gamma 0.001	0.74	0.83	0.78
Quantile RT se 1.5	0.73	0.84	0.78
Iterated SVM cost 100 gamma 0.001	0.72	0.89	0.81
Iterated SVM cost 50 gamma 0.001	0.74	0.89	0.82
Iterated SVM cost 5 gamma 0.01	0.73	0.92	0.82
Iterated SVM cost 10 gamma 0.01	0.73	0.92	0.83
Quantile SVM cost 1 gamma 0.001	0.79	0.86	0.83
Iterated SVM cost 5 gamma 0.001	0.79	0.89	0.84
Iterated SVM cost 10 gamma 0.001	0.78	0.9	0.84
Iterated SVM cost 1 gamma 0.01	0.79	0.93	0.86
Iterated SVM cost 50 gamma 0.01	0.75	0.97	0.86
Nmodels SVM cost 1 gamma 0.001	0.84	0.91	0.87
Iterated RT se 0.5	0.78	0.97	0.88
Iterated SVM cost 100 gamma 0.01	0.77	0.99	0.88
Iterated SVM cost 1 gamma 0.05	0.77	0.99	0.88
Iterated RT se 1	0.79	0.98	0.88
Iterated RT se 1.5	0.79	0.98	0.88
Iterated RT se 0	0.78	0.99	0.89
Iterated SVM cost 1 gamma 0.001	0.87	0.93	0.9
Iterated SVM cost 5 gamma 0.05	0.79	1.02	0.9
Iterated QRF ntree 500	0.83	0.99	0.91
Iterated QRF ntree 1500	0.83	0.99	0.91
Iterated QRF ntree 1000	0.83	0.99	0.91
Iterated RF ntree 1000	0.83	1.04	0.94
Iterated RF ntree 500	0.83	1.04	0.94
Iterated RF ntree 1500	0.84	1.04	0.94
Iterated SVM cost 10 gamma 0.05	0.85	1.04	0.94
Iterated SVM cost 1 gamma 0.1	0.85	1.06	0.95
Iterated SVM cost 5 gamma 0.1	0.9	1.1	1
Iterated SVM cost 10 gamma 0.1	0.92	1.13	1.02
Iterated SVM cost 50 gamma 0.05	0.94	1.14	1.04

Iterated SVM cost 100 gamma 0.05	0.93	1.15	1.04
Iterated SVM cost 50 gamma 0.1	0.96	1.2	1.08
Iterated SVM cost 100 gamma 0.1	1	1.22	1.11
RW	1.51	2.17	1.84

Table 2.7: All setups MAQ

### 2.3.2 TQE - Total Quantile Error

Figure 2.8 shows the results using the TQE error measure for all different setups.

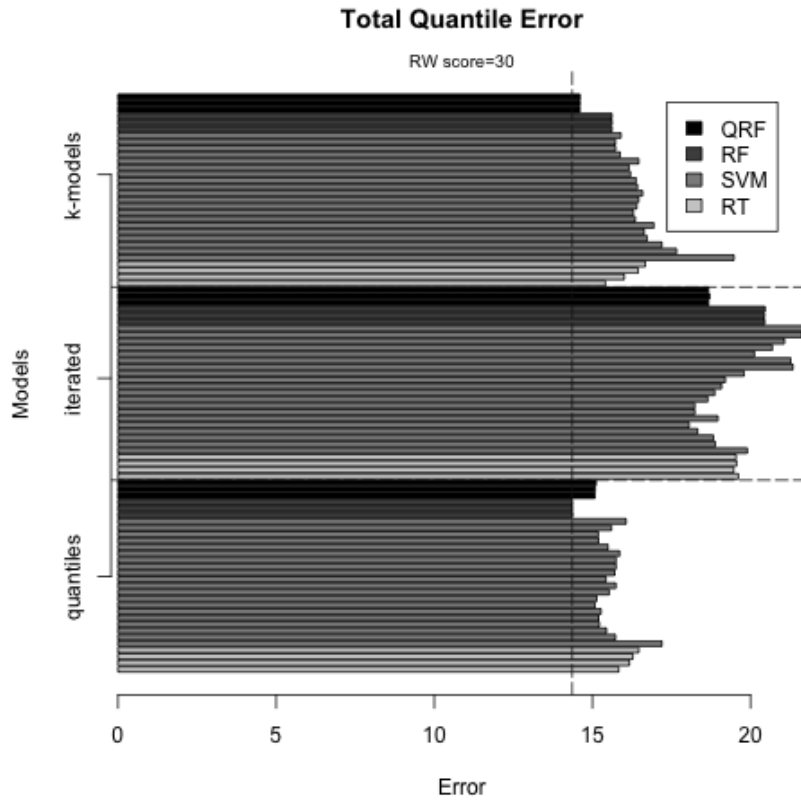


Figure 2.8: Stream 3

Table 2.8 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile RF ntree 1000	6.62	7.74	14.36
Quantile RF ntree 1500	6.63	7.74	14.37
Quantile RF ntree 500	6.63	7.74	14.37
Nmodels QRF ntree 500	6.65	7.95	14.6
Nmodels QRF ntree 1000	6.66	7.95	14.61
Nmodels QRF ntree 1500	6.66	7.95	14.61
Quantile SVM cost 5 gamma 0.01	6.76	8.33	15.08

Quantile QRF ntree 500	6.78	8.31	15.09
Quantile QRF ntree 1000	6.78	8.31	15.09
Quantile QRF ntree 1500	6.79	8.32	15.11
Quantile SVM cost 10 gamma 0.01	6.78	8.36	15.14
Quantile SVM cost 10 gamma 0.1	6.91	8.28	15.19
Quantile SVM cost 5 gamma 0.1	6.9	8.29	15.19
Quantile SVM cost 100 gamma 0.001	6.94	8.25	15.19
Quantile SVM cost 50 gamma 0.001	6.97	8.25	15.22
Quantile SVM cost 1 gamma 0.01	6.82	8.45	15.27
Nmodels RT se 0	7.03	8.38	15.41
Quantile SVM cost 1 gamma 0.05	6.86	8.57	15.43
Quantile SVM cost 10 gamma 0.001	7.03	8.41	15.45
Quantile SVM cost 1 gamma 0.1	6.96	8.54	15.49
Quantile SVM cost 50 gamma 0.01	7	8.53	15.53
Quantile SVM cost 50 gamma 0.1	7.24	8.36	15.6
Nmodels RF ntree 1500	7.1	8.52	15.62
Nmodels RF ntree 500	7.1	8.52	15.62
Nmodels RF ntree 1000	7.1	8.52	15.62
Quantile SVM cost 5 gamma 0.05	7.09	8.61	15.7
Nmodels SVM cost 50 gamma 0.1	7.36	8.37	15.73
Quantile SVM cost 5 gamma 0.001	7.15	8.58	15.73
Nmodels SVM cost 10 gamma 0.1	7.13	8.6	15.73
Quantile SVM cost 100 gamma 0.01	7.13	8.62	15.74
Quantile SVM cost 50 gamma 0.05	7.23	8.52	15.75
Quantile SVM cost 10 gamma 0.05	7.15	8.6	15.75
Quantile RT se 0	7.38	8.45	15.83
Quantile SVM cost 100 gamma 0.05	7.32	8.54	15.86
Nmodels SVM cost 5 gamma 0.1	7.13	8.75	15.88
Nmodels SVM cost 100 gamma 0.1	7.5	8.4	15.9
Nmodels RT se 0.5	7.33	8.68	16.01
Quantile SVM cost 100 gamma 0.1	7.55	8.52	16.06
Nmodels SVM cost 100 gamma 0.05	7.46	8.7	16.16
Quantile RT se 0.5	7.49	8.68	16.17
Nmodels SVM cost 50 gamma 0.05	7.39	8.81	16.2
Quantile RT se 1	7.46	8.82	16.28
Nmodels SVM cost 10 gamma 0.01	7.42	8.88	16.29
Nmodels SVM cost 5 gamma 0.01	7.43	8.92	16.35
Nmodels SVM cost 10 gamma 0.05	7.31	9.07	16.38
Nmodels SVM cost 50 gamma 0.01	7.46	8.95	16.4
Nmodels SVM cost 5 gamma 0.05	7.33	9.09	16.42
Nmodels RT se 1	7.53	8.91	16.44

Nmodels SVM cost 100 gamma 0.01	7.47	9	16.46
Nmodels SVM cost 1 gamma 0.1	7.3	9.16	16.47
Quantile RT se 1.5	7.67	8.8	16.47
Nmodels SVM cost 1 gamma 0.05	7.42	9.17	16.59
Nmodels SVM cost 100 gamma 0.001	7.7	8.94	16.64
Nmodels RT se 1.5	7.56	9.11	16.68
Nmodels SVM cost 50 gamma 0.001	7.74	8.99	16.73
Nmodels SVM cost 1 gamma 0.01	7.63	9.31	16.94
Nmodels SVM cost 10 gamma 0.001	7.94	9.26	17.2
Quantile SVM cost 1 gamma 0.001	7.83	9.36	17.2
Nmodels SVM cost 5 gamma 0.001	8.13	9.54	17.66
Iterated SVM cost 100 gamma 0.001	7.83	10.23	18.06
Iterated SVM cost 10 gamma 0.01	7.67	10.57	18.24
Iterated SVM cost 5 gamma 0.01	7.72	10.52	18.24
Iterated SVM cost 50 gamma 0.001	8.09	10.24	18.33
Iterated SVM cost 50 gamma 0.01	7.8	10.85	18.65
Iterated QRF ntree 1500	8.25	10.42	18.67
Iterated QRF ntree 500	8.26	10.42	18.67
Iterated QRF ntree 1000	8.26	10.45	18.71
Iterated SVM cost 10 gamma 0.001	8.55	10.27	18.82
Iterated SVM cost 100 gamma 0.01	8.03	10.84	18.87
Iterated SVM cost 5 gamma 0.001	8.63	10.26	18.88
Iterated SVM cost 1 gamma 0.01	8.3	10.67	18.97
Iterated SVM cost 1 gamma 0.05	7.98	11.1	19.09
Iterated SVM cost 5 gamma 0.05	8.12	11.08	19.2
Iterated RT se 0.5	8.68	10.78	19.47
Nmodels SVM cost 1 gamma 0.001	8.99	10.48	19.48
Iterated RT se 1.5	8.72	10.82	19.54
Iterated RT se 1	8.73	10.83	19.56
Iterated RT se 0	8.7	10.92	19.62
Iterated SVM cost 10 gamma 0.05	8.67	11.13	19.8
Iterated SVM cost 1 gamma 0.001	9.24	10.65	19.9
Iterated SVM cost 1 gamma 0.1	8.66	11.47	20.12
Iterated RF ntree 1000	8.89	11.55	20.44
Iterated RF ntree 500	8.9	11.55	20.45
Iterated RF ntree 1500	8.91	11.55	20.46
Iterated SVM cost 5 gamma 0.1	9.11	11.58	20.69
Iterated SVM cost 10 gamma 0.1	9.35	11.73	21.07
Iterated SVM cost 100 gamma 0.05	9.44	11.84	21.27
Iterated SVM cost 50 gamma 0.05	9.48	11.86	21.34
Iterated SVM cost 50 gamma 0.1	9.62	12.01	21.63

Iterated SVM cost 100 gamma 0.1	9.91	12.06	21.97
RW	13.85	16.07	29.92

Table 2.8: All setups TQE



### 2.3.3 Utility

Figure 2.9 shows the results using the Utility error measure (larger is better) for all different setups.

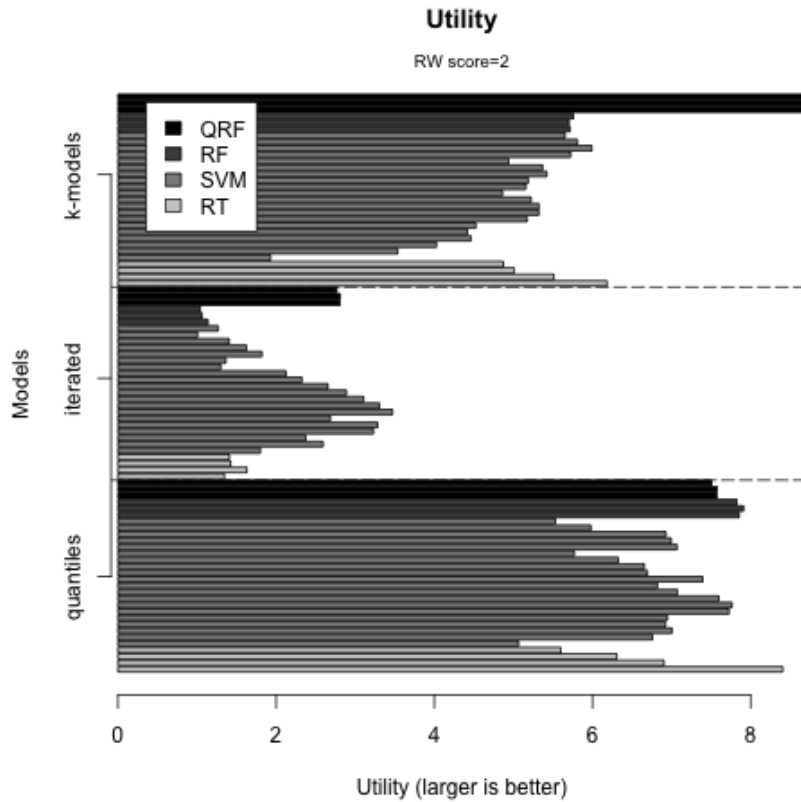


Figure 2.9: Stream 3

Table 2.9 shows all setups order by the Utility.

	utility
Nmodels QRF ntree 500	8.78
Nmodels QRF ntree 1500	8.76
Nmodels QRF ntree 1000	8.74
Quantile RT se 0	8.41
Quantile RF ntree 1000	7.91
Quantile RF ntree 500	7.86
Quantile RF ntree 1500	7.83

Quantile SVM cost 5 gamma 0.01	7.76
Quantile SVM cost 1 gamma 0.01	7.73
Quantile SVM cost 10 gamma 0.01	7.6
Quantile QRF ntree 1000	7.58
Quantile QRF ntree 500	7.57
Quantile QRF ntree 1500	7.51
Quantile SVM cost 1 gamma 0.05	7.39
Quantile SVM cost 50 gamma 0.01	7.07
Quantile SVM cost 1 gamma 0.1	7.07
Quantile SVM cost 10 gamma 0.001	7
Quantile SVM cost 5 gamma 0.1	7
Quantile SVM cost 100 gamma 0.001	6.95
Quantile SVM cost 10 gamma 0.1	6.93
Quantile SVM cost 50 gamma 0.001	6.92
Quantile RT se 0.5	6.9
Quantile SVM cost 100 gamma 0.01	6.82
Quantile SVM cost 5 gamma 0.001	6.76
Quantile SVM cost 5 gamma 0.05	6.69
Quantile SVM cost 10 gamma 0.05	6.66
Quantile SVM cost 50 gamma 0.05	6.33
Quantile RT se 1	6.31
Nmodels RT se 0	6.18
Nmodels SVM cost 10 gamma 0.1	5.99
Quantile SVM cost 50 gamma 0.1	5.98
Nmodels SVM cost 50 gamma 0.1	5.81
Quantile SVM cost 100 gamma 0.05	5.77
Nmodels RF ntree 1500	5.76
Nmodels SVM cost 5 gamma 0.1	5.73
Nmodels RF ntree 500	5.72
Nmodels RF ntree 1000	5.7
Nmodels SVM cost 100 gamma 0.1	5.65
Quantile RT se 1.5	5.6
Quantile SVM cost 100 gamma 0.1	5.53
Nmodels RT se 0.5	5.51
Nmodels SVM cost 50 gamma 0.05	5.42
Nmodels SVM cost 100 gamma 0.05	5.37
Nmodels SVM cost 50 gamma 0.01	5.32
Nmodels SVM cost 10 gamma 0.01	5.32
Nmodels SVM cost 100 gamma 0.01	5.22
Nmodels SVM cost 10 gamma 0.05	5.19
Nmodels SVM cost 5 gamma 0.01	5.17

Nmodels SVM cost 5 gamma 0.05	5.16
Quantile SVM cost 1 gamma 0.001	5.07
Nmodels RT se 1	5.01
Nmodels SVM cost 1 gamma 0.1	4.94
Nmodels RT se 1.5	4.87
Nmodels SVM cost 1 gamma 0.05	4.86
Nmodels SVM cost 1 gamma 0.01	4.53
Nmodels SVM cost 50 gamma 0.001	4.46
Nmodels SVM cost 100 gamma 0.001	4.42
Nmodels SVM cost 10 gamma 0.001	4.03
Nmodels SVM cost 5 gamma 0.001	3.54
Iterated SVM cost 5 gamma 0.01	3.47
Iterated SVM cost 10 gamma 0.01	3.3
Iterated SVM cost 100 gamma 0.001	3.28
Iterated SVM cost 50 gamma 0.001	3.23
Iterated SVM cost 50 gamma 0.01	3.11
Iterated SVM cost 100 gamma 0.01	2.89
Iterated QRF ntree 1000	2.81
Iterated QRF ntree 500	2.81
Iterated QRF ntree 1500	2.77
Iterated SVM cost 1 gamma 0.01	2.68
Iterated SVM cost 1 gamma 0.05	2.65
Iterated SVM cost 5 gamma 0.001	2.59
Iterated SVM cost 10 gamma 0.001	2.37
Iterated SVM cost 5 gamma 0.05	2.33
Iterated SVM cost 10 gamma 0.05	2.12
RW	2
Nmodels SVM cost 1 gamma 0.001	1.93
Iterated SVM cost 1 gamma 0.1	1.82
Iterated SVM cost 1 gamma 0.001	1.8
Iterated RT se 0.5	1.63
Iterated SVM cost 5 gamma 0.1	1.62
Iterated RT se 1	1.42
Iterated RT se 1.5	1.41
Iterated SVM cost 10 gamma 0.1	1.41
Iterated SVM cost 100 gamma 0.05	1.36
Iterated RT se 0	1.35
Iterated SVM cost 50 gamma 0.05	1.3
Iterated SVM cost 100 gamma 0.1	1.27
Iterated RF ntree 500	1.14
Iterated RF ntree 1000	1.06

Iterated RF ntree 1500	1.04
Iterated SVM cost 50 gamma 0.1	1.01

Table 2.9: All setups Utility

## 2.4 Stream 4

### 2.4.1 MAQ - Mean Absolute Quantile Deviation

Figure 2.10 shows the results using the MAQ error measure for all different setups.

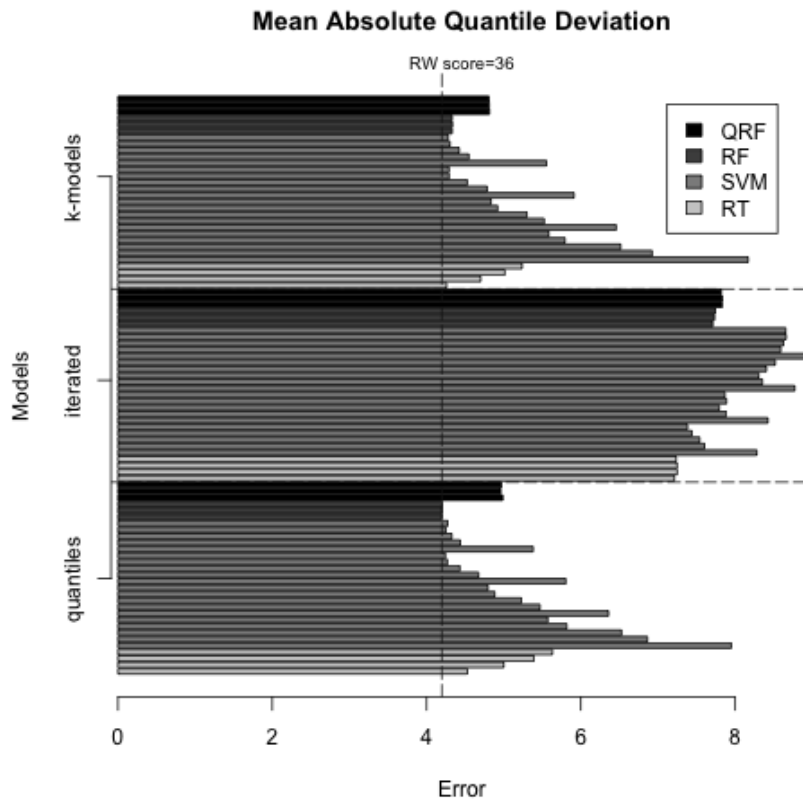


Figure 2.10: Stream 4

Table 2.10 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile RF ntree 500	4.42	3.97	4.2
Quantile RF ntree 1000	4.43	3.97	4.2
Quantile RF ntree 1500	4.43	3.98	4.2
Quantile SVM cost 100 gamma 0.05	4.22	4.27	4.24
Quantile SVM cost 50 gamma 0.1	4.22	4.28	4.25

Nmodels RT se 0	4.27	4.25	4.26
Quantile SVM cost 50 gamma 0.05	4.22	4.31	4.27
Quantile SVM cost 100 gamma 0.1	4.27	4.28	4.27
Nmodels SVM cost 100 gamma 0.1	4.28	4.28	4.28
Nmodels SVM cost 100 gamma 0.05	4.21	4.38	4.29
Nmodels SVM cost 50 gamma 0.05	4.27	4.31	4.29
Nmodels SVM cost 50 gamma 0.1	4.28	4.33	4.3
Quantile SVM cost 10 gamma 0.1	4.29	4.37	4.33
Nmodels RF ntree 1500	4.58	4.09	4.33
Nmodels RF ntree 500	4.58	4.08	4.33
Nmodels RF ntree 1000	4.58	4.09	4.33
Nmodels SVM cost 10 gamma 0.1	4.45	4.39	4.42
Quantile SVM cost 10 gamma 0.05	4.4	4.46	4.43
Quantile SVM cost 5 gamma 0.1	4.41	4.46	4.44
Nmodels SVM cost 10 gamma 0.05	4.58	4.48	4.53
Quantile RT se 0	4.87	4.19	4.53
Nmodels SVM cost 5 gamma 0.1	4.6	4.49	4.55
Quantile SVM cost 5 gamma 0.05	4.62	4.73	4.67
Nmodels RT se 0.5	4.69	4.71	4.7
Nmodels SVM cost 5 gamma 0.05	4.82	4.75	4.78
Quantile SVM cost 100 gamma 0.01	4.73	4.87	4.8
Nmodels QRF ntree 1500	4.53	5.09	4.81
Nmodels QRF ntree 1000	4.53	5.09	4.81
Nmodels QRF ntree 500	4.54	5.09	4.81
Nmodels SVM cost 100 gamma 0.01	4.76	4.91	4.83
Quantile SVM cost 50 gamma 0.01	4.81	4.96	4.88
Nmodels SVM cost 50 gamma 0.01	4.86	4.98	4.92
Quantile QRF ntree 1000	4.71	5.21	4.96
Quantile QRF ntree 1500	4.71	5.23	4.97
Quantile QRF ntree 500	4.74	5.24	4.99
Quantile RT se 0.5	5.32	4.68	5
Nmodels RT se 1	5.07	4.96	5.01
Quantile SVM cost 10 gamma 0.01	5.21	5.24	5.23
Nmodels RT se 1.5	5.29	5.19	5.24
Nmodels SVM cost 10 gamma 0.01	5.31	5.29	5.3
Quantile SVM cost 1 gamma 0.1	5.35	5.41	5.38
Quantile RT se 1	5.75	5.04	5.39
Quantile SVM cost 5 gamma 0.01	5.46	5.47	5.47
Nmodels SVM cost 5 gamma 0.01	5.61	5.44	5.52
Nmodels SVM cost 1 gamma 0.1	5.68	5.43	5.55
Quantile SVM cost 100 gamma 0.001	5.53	5.61	5.57

Nmodels SVM cost 100 gamma 0.001	5.76	5.4	5.58
Quantile RT se 1.5	6	5.26	5.63
Nmodels SVM cost 50 gamma 0.001	5.94	5.64	5.79
Quantile SVM cost 1 gamma 0.05	5.76	5.85	5.8
Quantile SVM cost 50 gamma 0.001	5.72	5.91	5.82
Nmodels SVM cost 1 gamma 0.05	6.02	5.8	5.91
Quantile SVM cost 1 gamma 0.01	6.37	6.35	6.36
Nmodels SVM cost 1 gamma 0.01	6.77	6.15	6.46
Nmodels SVM cost 10 gamma 0.001	6.65	6.38	6.51
Quantile SVM cost 10 gamma 0.001	6.42	6.63	6.53
Quantile SVM cost 5 gamma 0.001	6.78	6.94	6.86
Nmodels SVM cost 5 gamma 0.001	7.14	6.71	6.92
Iterated RT se 0	7.18	7.24	7.21
Iterated RT se 1.5	7.23	7.24	7.23
Iterated RT se 1	7.23	7.26	7.25
Iterated RT se 0.5	7.25	7.24	7.25
Iterated SVM cost 100 gamma 0.001	7.32	7.45	7.38
Iterated SVM cost 50 gamma 0.001	7.42	7.46	7.44
Iterated SVM cost 10 gamma 0.001	7.52	7.55	7.54
Iterated SVM cost 5 gamma 0.001	7.6	7.6	7.6
Iterated RF ntree 500	7.64	7.78	7.71
Iterated RF ntree 1000	7.65	7.81	7.73
Iterated RF ntree 1500	7.67	7.81	7.74
Iterated SVM cost 10 gamma 0.01	7.72	7.87	7.79
Iterated QRF ntree 1500	7.8	7.84	7.82
Iterated QRF ntree 500	7.8	7.86	7.83
Iterated QRF ntree 1000	7.81	7.85	7.83
Iterated SVM cost 100 gamma 0.01	7.77	7.97	7.87
Iterated SVM cost 5 gamma 0.01	7.8	7.96	7.88
Iterated SVM cost 50 gamma 0.01	7.8	7.97	7.89
Quantile SVM cost 1 gamma 0.001	7.92	7.97	7.95
Nmodels SVM cost 1 gamma 0.001	8.33	8.01	8.17
Iterated SVM cost 1 gamma 0.001	8.24	8.32	8.28
Iterated SVM cost 10 gamma 0.05	8.01	8.6	8.3
Iterated SVM cost 5 gamma 0.05	8.15	8.56	8.35
Iterated SVM cost 50 gamma 0.05	8.05	8.76	8.4
Iterated SVM cost 1 gamma 0.01	8.42	8.43	8.42
Iterated SVM cost 100 gamma 0.05	8.16	8.88	8.52
Iterated SVM cost 5 gamma 0.1	8.31	8.88	8.59
Iterated SVM cost 10 gamma 0.1	8.34	8.9	8.62
Iterated SVM cost 100 gamma 0.1	8.37	8.94	8.65

Iterated SVM cost 50 gamma 0.1	8.37	8.95	8.66
Iterated SVM cost 1 gamma 0.05	8.57	8.97	8.77
Iterated SVM cost 1 gamma 0.1	8.75	9.26	9
RW	39.53	32.72	36.13

Table 2.10: All setups MAQ



## 2.4.2 TQE - Total Quantile Error

Figure 2.11 shows the results using the TQE error measure for all different setups.

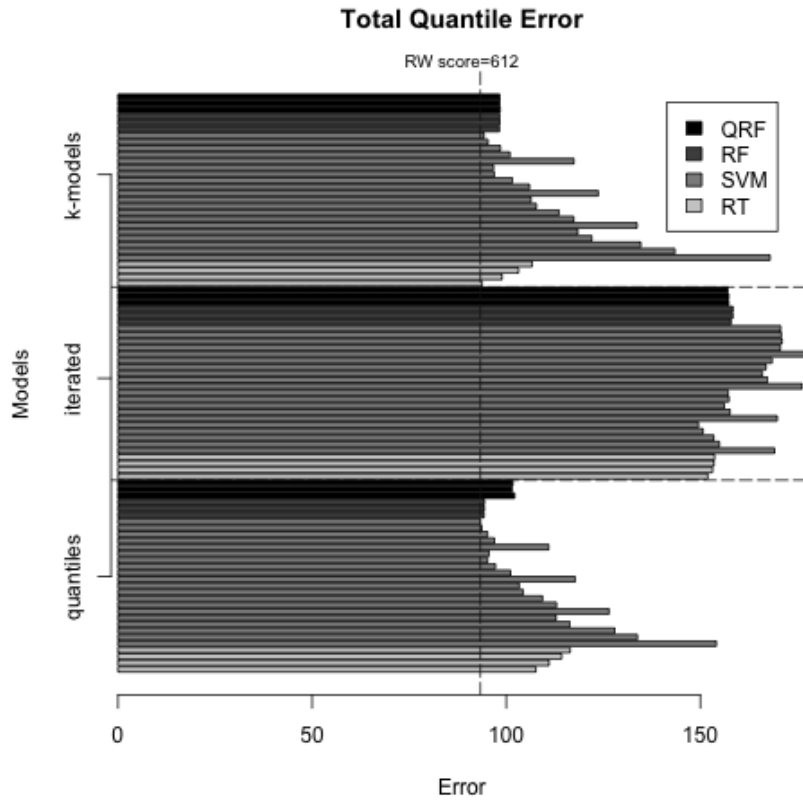


Figure 2.11: Stream 4

Table 2.11 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile SVM cost 100 gamma 0.1	47.49	45.83	93.32
Quantile SVM cost 50 gamma 0.1	47.73	45.96	93.69
Nmodels RT se 0	48.62	45.15	93.77
Nmodels SVM cost 100 gamma 0.1	47.92	46.36	94.28
Quantile RF ntree 500	50.53	43.76	94.29
Quantile RF ntree 1000	50.56	43.8	94.37
Quantile RF ntree 1500	50.57	43.83	94.4

Quantile SVM cost 10 gamma 0.1	48.77	46.41	95.17
Quantile SVM cost 50 gamma 0.05	49.08	46.11	95.2
Nmodels SVM cost 50 gamma 0.1	48.43	46.88	95.31
Quantile SVM cost 100 gamma 0.05	49.31	46.3	95.61
Nmodels SVM cost 100 gamma 0.05	49.04	47.7	96.74
Nmodels SVM cost 50 gamma 0.05	49.45	47.45	96.9
Quantile SVM cost 5 gamma 0.1	49.81	47.18	96.99
Quantile SVM cost 10 gamma 0.05	50.19	47.02	97.21
Nmodels RF ntree 500	52.52	45.72	98.24
Nmodels RF ntree 1500	52.52	45.78	98.3
Nmodels RF ntree 1000	52.53	45.79	98.32
Nmodels QRF ntree 1500	48.84	49.51	98.35
Nmodels QRF ntree 1000	48.83	49.55	98.38
Nmodels QRF ntree 500	48.88	49.54	98.41
Nmodels SVM cost 10 gamma 0.1	50.45	48.06	98.51
Nmodels RT se 0.5	51.12	47.81	98.93
Nmodels SVM cost 5 gamma 0.1	52.03	48.92	100.95
Quantile SVM cost 5 gamma 0.05	52.15	49	101.15
Quantile QRF ntree 1000	51.58	49.92	101.5
Nmodels SVM cost 10 gamma 0.05	52.59	48.96	101.55
Quantile QRF ntree 1500	51.53	50.19	101.72
Quantile QRF ntree 500	51.9	50.27	102.18
Nmodels RT se 1	53.69	49.48	103.18
Quantile SVM cost 100 gamma 0.01	53.82	49.49	103.31
Quantile SVM cost 50 gamma 0.01	54.26	50.07	104.33
Nmodels SVM cost 5 gamma 0.05	54.95	51.04	105.99
Nmodels SVM cost 100 gamma 0.01	54.79	51.59	106.38
Nmodels RT se 1.5	55.45	51.26	106.71
Quantile RT se 0	59.48	48.17	107.65
Nmodels SVM cost 50 gamma 0.01	55.67	52.11	107.77
Quantile SVM cost 10 gamma 0.01	57.06	52.29	109.35
Quantile SVM cost 1 gamma 0.1	57	53.93	110.93
Quantile RT se 0.5	60.81	50.22	111.04
Quantile SVM cost 100 gamma 0.001	58.36	54.48	112.85
Quantile SVM cost 5 gamma 0.01	58.95	54	112.95
Nmodels SVM cost 10 gamma 0.01	59.36	54.21	113.57
Quantile RT se 1	62.69	51.61	114.3
Quantile SVM cost 50 gamma 0.001	60.14	56.28	116.42
Quantile RT se 1.5	63.58	52.89	116.47
Nmodels SVM cost 5 gamma 0.01	61.86	55.53	117.39
Nmodels SVM cost 1 gamma 0.1	61.17	56.26	117.43

Quantile SVM cost 1 gamma 0.05	61.14	56.6	117.73
Nmodels SVM cost 100 gamma 0.001	62.61	55.84	118.45
Nmodels SVM cost 50 gamma 0.001	64.74	57.29	122.03
Nmodels SVM cost 1 gamma 0.05	65.15	58.54	123.69
Quantile SVM cost 1 gamma 0.01	65.75	60.72	126.47
Quantile SVM cost 10 gamma 0.001	66.78	61.2	127.98
Nmodels SVM cost 1 gamma 0.01	72.13	61.57	133.7
Quantile SVM cost 5 gamma 0.001	70.49	63.3	133.78
Nmodels SVM cost 10 gamma 0.001	72.5	62.17	134.67
Nmodels SVM cost 5 gamma 0.001	78.27	65.19	143.45
Iterated SVM cost 100 gamma 0.001	74.39	75.12	149.51
Iterated SVM cost 50 gamma 0.001	75.96	74.74	150.7
Iterated RT se 0	75.25	76.65	151.9
Iterated RT se 0.5	76.11	77.05	153.16
Iterated SVM cost 10 gamma 0.001	79.09	74.35	153.44
Iterated RT se 1	76.32	77.19	153.51
Iterated RT se 1.5	76.49	77.18	153.67
Quantile SVM cost 1 gamma 0.001	83.43	70.69	154.11
Iterated SVM cost 5 gamma 0.001	80.38	74.53	154.91
Iterated SVM cost 10 gamma 0.01	77.73	78.43	156.16
Iterated QRF ntree 1500	77.42	79.7	157.12
Iterated SVM cost 100 gamma 0.01	76.19	80.96	157.15
Iterated QRF ntree 500	77.62	79.67	157.29
Iterated QRF ntree 1000	77.57	79.73	157.3
Iterated SVM cost 50 gamma 0.01	77.18	80.19	157.37
Iterated SVM cost 5 gamma 0.01	79.21	78.43	157.64
Iterated RF ntree 500	79.68	78.21	157.89
Iterated RF ntree 1000	79.89	78.47	158.36
Iterated RF ntree 1500	80.01	78.37	158.38
Iterated SVM cost 10 gamma 0.05	78.9	87.05	165.95
Iterated SVM cost 50 gamma 0.05	78.93	87.99	166.92
Iterated SVM cost 5 gamma 0.05	80.13	87.17	167.3
Nmodels SVM cost 1 gamma 0.001	92.39	75.56	167.95
Iterated SVM cost 100 gamma 0.05	79.8	88.67	168.48
Iterated SVM cost 1 gamma 0.001	89.88	79.24	169.12
Iterated SVM cost 1 gamma 0.01	85.95	83.86	169.81
Iterated SVM cost 5 gamma 0.1	81.37	89.24	170.61
Iterated SVM cost 100 gamma 0.1	82	88.72	170.71
Iterated SVM cost 50 gamma 0.1	82.08	88.78	170.86
Iterated SVM cost 10 gamma 0.1	81.76	89.27	171.03
Iterated SVM cost 1 gamma 0.05	84.19	92.04	176.23

Iterated SVM cost 1 gamma 0.1	85.29	93.64	178.94
RW	287.41	324.83	612.25

Table 2.11: All setups TQE

### 2.4.3 Utility

Figure 2.12 shows the results using the Utility error measure (larger is better) for all different setups.

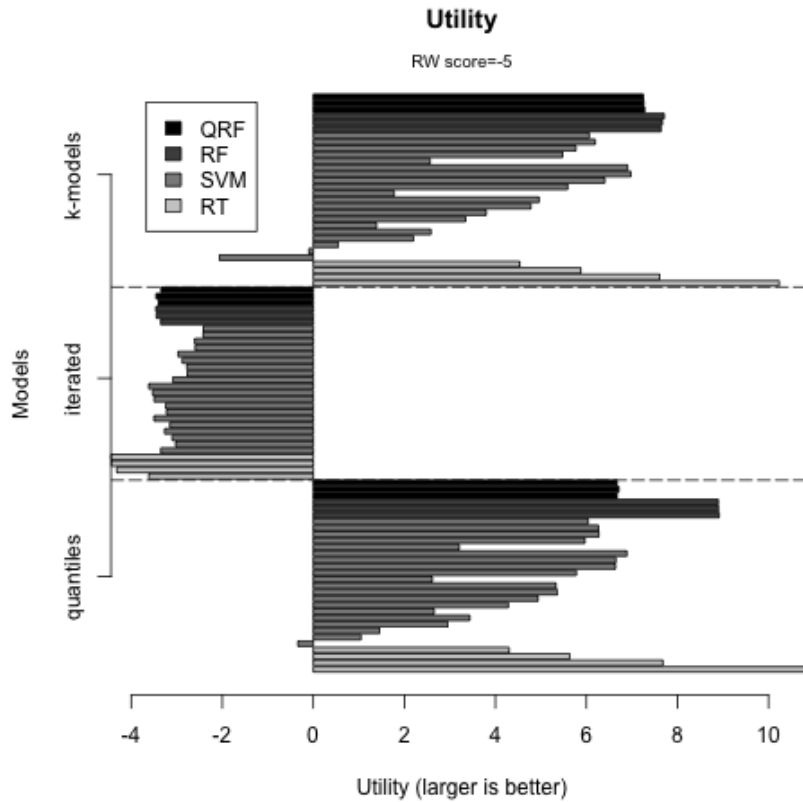


Figure 2.12: Stream 4

Table 2.12 shows all setups order by the Utility.

	utility
Quantile RT se 0	10.97
Nmodels RT se 0	10.24
Quantile RF ntree 500	8.92
Quantile RF ntree 1000	8.9
Quantile RF ntree 1500	8.9
Nmodels RF ntree 1500	7.71
Quantile RT se 0.5	7.68

Nmodels RF ntree 1000	7.67
Nmodels RF ntree 500	7.64
Nmodels RT se 0.5	7.61
Nmodels QRF ntree 500	7.28
Nmodels QRF ntree 1000	7.26
Nmodels QRF ntree 1500	7.25
Nmodels SVM cost 50 gamma 0.05	6.98
Nmodels SVM cost 100 gamma 0.05	6.9
Quantile SVM cost 100 gamma 0.05	6.89
Quantile QRF ntree 1000	6.71
Quantile QRF ntree 500	6.67
Quantile QRF ntree 1500	6.67
Quantile SVM cost 50 gamma 0.05	6.65
Quantile SVM cost 10 gamma 0.05	6.64
Nmodels SVM cost 10 gamma 0.05	6.41
Quantile SVM cost 10 gamma 0.1	6.27
Quantile SVM cost 50 gamma 0.1	6.26
Nmodels SVM cost 50 gamma 0.1	6.19
Nmodels SVM cost 100 gamma 0.1	6.06
Quantile SVM cost 100 gamma 0.1	6.04
Quantile SVM cost 5 gamma 0.1	5.97
Nmodels RT se 1	5.88
Quantile SVM cost 5 gamma 0.05	5.78
Nmodels SVM cost 10 gamma 0.1	5.77
Quantile RT se 1	5.63
Nmodels SVM cost 5 gamma 0.05	5.59
Nmodels SVM cost 5 gamma 0.1	5.48
Quantile SVM cost 50 gamma 0.01	5.36
Quantile SVM cost 100 gamma 0.01	5.33
Nmodels SVM cost 100 gamma 0.01	4.96
Quantile SVM cost 10 gamma 0.01	4.94
Nmodels SVM cost 50 gamma 0.01	4.78
Nmodels RT se 1.5	4.54
Quantile RT se 1.5	4.3
Quantile SVM cost 5 gamma 0.01	4.29
Nmodels SVM cost 10 gamma 0.01	3.8
Quantile SVM cost 100 gamma 0.001	3.44
Nmodels SVM cost 5 gamma 0.01	3.35
Quantile SVM cost 1 gamma 0.1	3.21
Quantile SVM cost 50 gamma 0.001	2.96
Quantile SVM cost 1 gamma 0.01	2.66

Quantile SVM cost 1 gamma 0.05	2.62
Nmodels SVM cost 100 gamma 0.001	2.58
Nmodels SVM cost 1 gamma 0.1	2.57
Nmodels SVM cost 50 gamma 0.001	2.2
Nmodels SVM cost 1 gamma 0.05	1.78
Quantile SVM cost 10 gamma 0.001	1.46
Nmodels SVM cost 1 gamma 0.01	1.39
Quantile SVM cost 5 gamma 0.001	1.05
Nmodels SVM cost 10 gamma 0.001	0.55
Nmodels SVM cost 5 gamma 0.001	-0.1
Quantile SVM cost 1 gamma 0.001	-0.34
Nmodels SVM cost 1 gamma 0.001	-2.06
Iterated SVM cost 100 gamma 0.1	-2.41
Iterated SVM cost 50 gamma 0.1	-2.42
Iterated SVM cost 5 gamma 0.1	-2.6
Iterated SVM cost 10 gamma 0.1	-2.6
Iterated SVM cost 10 gamma 0.05	-2.77
Iterated SVM cost 50 gamma 0.05	-2.78
Iterated SVM cost 100 gamma 0.05	-2.88
Iterated SVM cost 1 gamma 0.1	-2.97
Iterated SVM cost 5 gamma 0.001	-3.02
Iterated SVM cost 5 gamma 0.05	-3.08
Iterated SVM cost 10 gamma 0.001	-3.1
Iterated SVM cost 100 gamma 0.001	-3.15
Iterated SVM cost 5 gamma 0.01	-3.22
Iterated SVM cost 10 gamma 0.01	-3.25
Iterated SVM cost 50 gamma 0.001	-3.27
Iterated QRF ntree 1500	-3.35
Iterated SVM cost 1 gamma 0.001	-3.35
Iterated RF ntree 500	-3.35
Iterated QRF ntree 500	-3.4
Iterated RF ntree 1000	-3.45
Iterated QRF ntree 1000	-3.45
Iterated RF ntree 1500	-3.46
Iterated SVM cost 50 gamma 0.01	-3.5
Iterated SVM cost 1 gamma 0.01	-3.5
Iterated SVM cost 100 gamma 0.01	-3.53
Iterated RT se 0	-3.61
Iterated SVM cost 1 gamma 0.05	-3.62
Iterated RT se 0.5	-4.32
Iterated RT se 1	-4.43

Iterated RT se 1.5	-4.44
RW	-4.52

Table 2.12: All setups Utility



## 2.5 Stream 5

### 2.5.1 MAQ - Mean Absolute Quantile Deviation

Figure 2.13 shows the results using the MAQ error measure for all different setups.

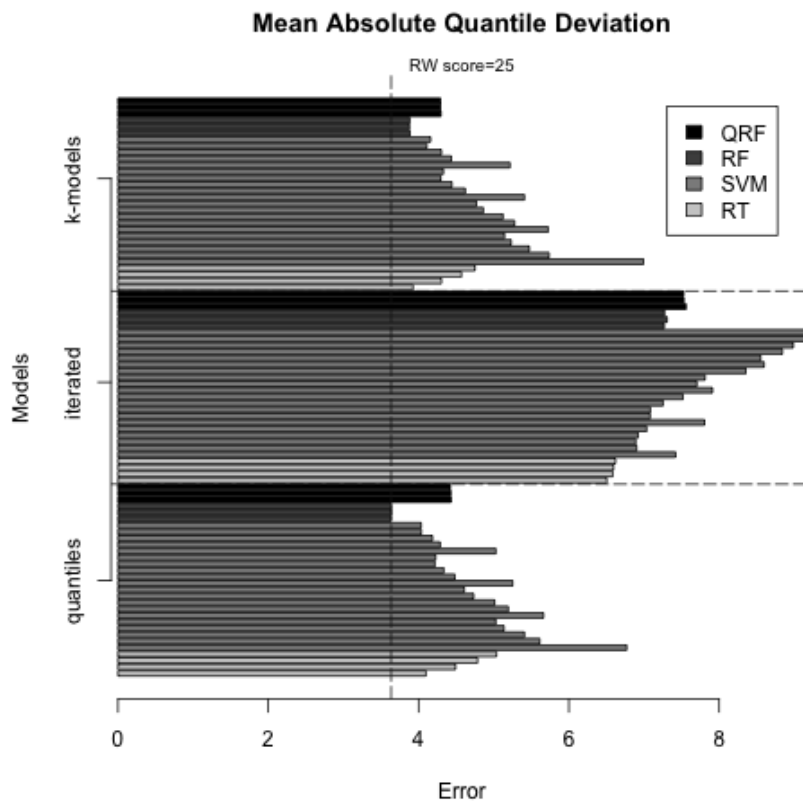


Figure 2.13: Stream 5

Table 2.13 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile RF ntree 500	3.61	3.66	3.63
Quantile RF ntree 1000	3.61	3.67	3.64
Quantile RF ntree 1500	3.61	3.67	3.64
Nmodels RF ntree 1000	3.92	3.84	3.88
Nmodels RF ntree 1500	3.92	3.84	3.88

Nmodels RF ntree 500	3.92	3.85	3.88
Nmodels RT se 0	3.87	3.98	3.93
Quantile SVM cost 100 gamma 0.1	3.99	4.07	4.03
Quantile SVM cost 50 gamma 0.1	3.98	4.09	4.04
Quantile RT se 0	4.26	3.93	4.1
Nmodels SVM cost 50 gamma 0.1	4.07	4.15	4.11
Nmodels SVM cost 100 gamma 0.1	4.08	4.24	4.16
Quantile SVM cost 10 gamma 0.1	4.08	4.29	4.18
Quantile SVM cost 50 gamma 0.05	4.02	4.41	4.22
Quantile SVM cost 100 gamma 0.05	4.07	4.38	4.23
Quantile SVM cost 5 gamma 0.1	4.19	4.39	4.29
Nmodels QRF ntree 1000	3.97	4.62	4.29
Nmodels QRF ntree 1500	3.97	4.62	4.29
Nmodels SVM cost 50 gamma 0.05	4.09	4.49	4.29
Nmodels QRF ntree 500	3.97	4.62	4.3
Nmodels SVM cost 10 gamma 0.1	4.19	4.41	4.3
Nmodels RT se 0.5	4.35	4.26	4.3
Nmodels SVM cost 100 gamma 0.05	4.13	4.53	4.33
Quantile SVM cost 10 gamma 0.05	4.15	4.52	4.33
Quantile QRF ntree 1500	4.18	4.67	4.42
Quantile QRF ntree 1000	4.17	4.68	4.43
Quantile QRF ntree 500	4.17	4.69	4.43
Nmodels SVM cost 5 gamma 0.1	4.31	4.56	4.43
Nmodels SVM cost 10 gamma 0.05	4.22	4.66	4.44
Quantile SVM cost 5 gamma 0.05	4.31	4.66	4.48
Quantile RT se 0.5	4.74	4.24	4.49
Nmodels RT se 1	4.64	4.5	4.57
Quantile SVM cost 100 gamma 0.01	4.41	4.81	4.61
Nmodels SVM cost 5 gamma 0.05	4.39	4.85	4.62
Quantile SVM cost 50 gamma 0.01	4.53	4.93	4.73
Nmodels RT se 1.5	4.82	4.68	4.75
Nmodels SVM cost 100 gamma 0.01	4.55	4.98	4.77
Quantile RT se 1	5.05	4.52	4.78
Nmodels SVM cost 50 gamma 0.01	4.6	5.12	4.86
Quantile SVM cost 10 gamma 0.01	4.85	5.17	5.01
Quantile SVM cost 100 gamma 0.001	4.83	5.22	5.03
Quantile SVM cost 1 gamma 0.1	4.9	5.15	5.03
Quantile RT se 1.5	5.33	4.75	5.04
Nmodels SVM cost 10 gamma 0.01	4.93	5.31	5.12
Quantile SVM cost 50 gamma 0.001	4.95	5.32	5.14
Nmodels SVM cost 100 gamma 0.001	4.76	5.52	5.14

Quantile SVM cost 5 gamma 0.01	5.05	5.34	5.19
Nmodels SVM cost 1 gamma 0.1	5.09	5.34	5.22
Nmodels SVM cost 50 gamma 0.001	4.85	5.61	5.23
Quantile SVM cost 1 gamma 0.05	5.09	5.41	5.25
Nmodels SVM cost 5 gamma 0.01	5.13	5.42	5.28
Quantile SVM cost 10 gamma 0.001	5.28	5.54	5.41
Nmodels SVM cost 1 gamma 0.05	5.22	5.6	5.41
Nmodels SVM cost 10 gamma 0.001	5.18	5.76	5.47
Quantile SVM cost 5 gamma 0.001	5.49	5.73	5.61
Quantile SVM cost 1 gamma 0.01	5.58	5.75	5.66
Nmodels SVM cost 1 gamma 0.01	5.57	5.87	5.72
Nmodels SVM cost 5 gamma 0.001	5.49	5.99	5.74
Iterated RT se 0	6.03	6.98	6.5
Iterated RT se 0.5	6.09	7.08	6.58
Iterated RT se 1	6.1	7.09	6.59
Iterated RT se 1.5	6.08	7.16	6.62
Quantile SVM cost 1 gamma 0.001	6.64	6.9	6.77
Iterated SVM cost 10 gamma 0.001	6.48	7.3	6.89
Iterated SVM cost 5 gamma 0.001	6.41	7.39	6.9
Iterated SVM cost 50 gamma 0.001	6.66	7.18	6.92
Nmodels SVM cost 1 gamma 0.001	6.62	7.36	6.99
Iterated SVM cost 100 gamma 0.001	6.88	7.19	7.03
Iterated SVM cost 5 gamma 0.01	6.8	7.36	7.08
Iterated SVM cost 10 gamma 0.01	6.79	7.37	7.08
Iterated SVM cost 50 gamma 0.01	6.87	7.64	7.25
Iterated RF ntree 500	6.89	7.64	7.27
Iterated RF ntree 1500	6.93	7.62	7.27
Iterated RF ntree 1000	6.95	7.66	7.31
Iterated SVM cost 1 gamma 0.001	6.9	7.94	7.42
Iterated SVM cost 100 gamma 0.01	7.2	7.84	7.52
Iterated QRF ntree 1500	7.23	7.82	7.53
Iterated QRF ntree 1000	7.24	7.82	7.53
Iterated QRF ntree 500	7.27	7.85	7.56
Iterated SVM cost 5 gamma 0.05	7.34	8.07	7.7
Iterated SVM cost 1 gamma 0.01	7.47	8.14	7.81
Iterated SVM cost 10 gamma 0.05	7.42	8.21	7.81
Iterated SVM cost 1 gamma 0.05	7.5	8.32	7.91
Iterated SVM cost 50 gamma 0.05	7.88	8.83	8.35
Iterated SVM cost 1 gamma 0.1	8.29	8.82	8.55
Iterated SVM cost 100 gamma 0.05	8.12	9.08	8.6
Iterated SVM cost 5 gamma 0.1	8.69	8.99	8.84

Iterated SVM cost 10 gamma 0.1	8.83	9.14	8.99
Iterated SVM cost 50 gamma 0.1	8.91	9.42	9.17
Iterated SVM cost 100 gamma 0.1	8.96	9.53	9.24
RW	28.92	20.27	24.6

Table 2.13: All setups MAQ

## 2.5.2 TQE - Total Quantile Error

Figure 2.14 shows the results using the TQE error measure for all different setups.

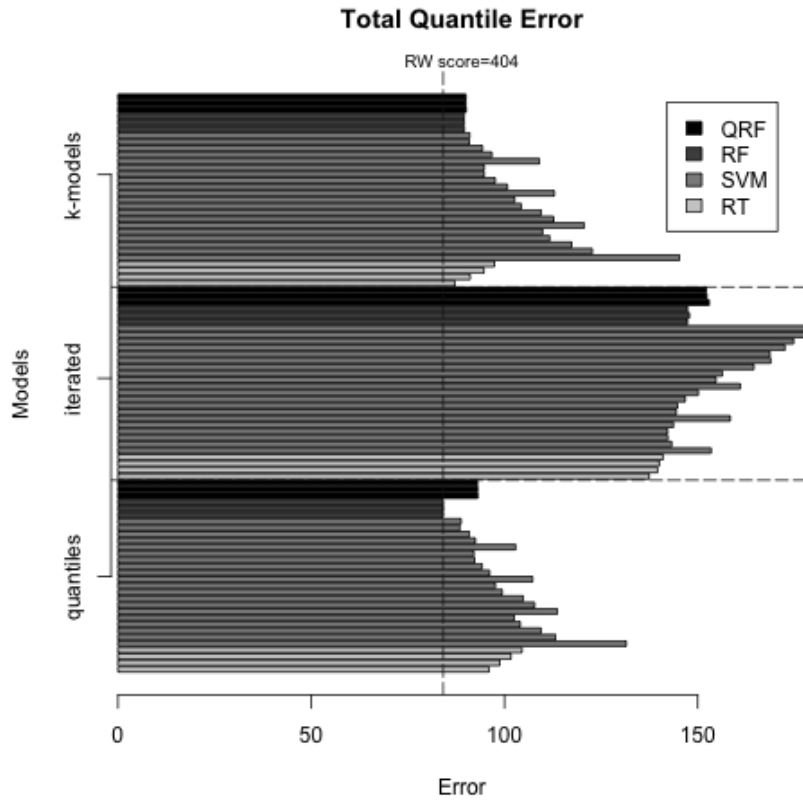


Figure 2.14: Stream 5

Table 2.14 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile RF ntree 500	42.26	41.85	84.11
Quantile RF ntree 1000	42.2	41.93	84.13
Quantile RF ntree 1500	42.22	41.93	84.15
Nmodels RT se 0	43.06	44.11	87.17
Quantile SVM cost 50 gamma 0.1	43.94	44.5	88.44
Quantile SVM cost 100 gamma 0.1	44.61	44.17	88.78
Nmodels RF ntree 1500	45.01	44.56	89.57

Nmodels RF ntree 1000	45.01	44.56	89.57
Nmodels RF ntree 500	44.98	44.64	89.62
Nmodels QRF ntree 1000	42.86	47.16	90.02
Nmodels QRF ntree 1500	42.87	47.16	90.04
Nmodels QRF ntree 500	42.93	47.17	90.1
Nmodels SVM cost 50 gamma 0.1	45.19	45.69	90.88
Quantile SVM cost 10 gamma 0.1	44.23	46.7	90.93
Nmodels SVM cost 100 gamma 0.1	45.04	45.95	90.99
Nmodels RT se 0.5	45.32	45.8	91.12
Quantile SVM cost 100 gamma 0.05	44.94	47.14	92.08
Quantile SVM cost 50 gamma 0.05	44.34	47.93	92.27
Quantile SVM cost 5 gamma 0.1	44.53	47.95	92.48
Quantile QRF ntree 1500	44.73	48.28	93.01
Quantile QRF ntree 1000	44.63	48.44	93.06
Quantile QRF ntree 500	44.61	48.48	93.09
Quantile SVM cost 10 gamma 0.05	44.44	49.77	94.2
Nmodels SVM cost 10 gamma 0.1	45.75	48.57	94.32
Nmodels RT se 1	46.84	47.83	94.68
Nmodels SVM cost 50 gamma 0.05	45.6	49.15	94.75
Nmodels SVM cost 100 gamma 0.05	45.98	48.78	94.76
Quantile RT se 0	50.2	45.81	96
Quantile SVM cost 5 gamma 0.05	45.13	51.03	96.16
Nmodels SVM cost 5 gamma 0.1	46.5	50.23	96.73
Nmodels RT se 1.5	47.89	49.51	97.4
Nmodels SVM cost 10 gamma 0.05	46.06	51.55	97.61
Quantile SVM cost 100 gamma 0.01	46.39	51.25	97.64
Quantile RT se 0.5	51.48	47.32	98.8
Quantile SVM cost 50 gamma 0.01	47.06	52.35	99.41
Nmodels SVM cost 5 gamma 0.05	47.26	53.49	100.75
Quantile RT se 1	52.68	49	101.67
Quantile SVM cost 100 gamma 0.001	49.72	52.8	102.52
Nmodels SVM cost 100 gamma 0.01	48.9	53.72	102.62
Quantile SVM cost 1 gamma 0.1	48.08	54.8	102.88
Quantile SVM cost 50 gamma 0.001	50.61	53.47	104.09
Nmodels SVM cost 50 gamma 0.01	49.25	55.07	104.32
Quantile RT se 1.5	53.44	51.08	104.52
Quantile SVM cost 10 gamma 0.01	49.14	55.73	104.87
Quantile SVM cost 1 gamma 0.05	49.63	57.64	107.27
Quantile SVM cost 5 gamma 0.01	50.21	57.59	107.79
Nmodels SVM cost 1 gamma 0.1	50.9	58.13	109.02
Quantile SVM cost 10 gamma 0.001	52.86	56.58	109.44

Nmodels SVM cost 10 gamma 0.01	51.26	58.22	109.48
Nmodels SVM cost 100 gamma 0.001	51.6	58.26	109.85
Nmodels SVM cost 50 gamma 0.001	52.56	59.13	111.69
Nmodels SVM cost 5 gamma 0.01	52.47	60.25	112.72
Nmodels SVM cost 1 gamma 0.05	52.02	60.88	112.9
Quantile SVM cost 5 gamma 0.001	54.36	58.87	113.23
Quantile SVM cost 1 gamma 0.01	52.93	60.73	113.65
Nmodels SVM cost 10 gamma 0.001	55.03	62.35	117.38
Nmodels SVM cost 1 gamma 0.01	55.13	65.45	120.58
Nmodels SVM cost 5 gamma 0.001	57.31	65.41	122.72
Quantile SVM cost 1 gamma 0.001	60.81	70.69	131.5
Iterated RT se 0	62.38	75.06	137.43
Iterated RT se 0.5	62.24	77.37	139.61
Iterated RT se 1	62.23	77.81	140.05
Iterated RT se 1.5	62.31	78.7	141.01
Iterated SVM cost 50 gamma 0.001	62.89	79.31	142.21
Iterated SVM cost 10 gamma 0.001	61.49	80.77	142.26
Iterated SVM cost 5 gamma 0.001	61.84	81.41	143.26
Iterated SVM cost 100 gamma 0.001	64.54	79.17	143.71
Iterated SVM cost 5 gamma 0.01	62.85	81.6	144.46
Iterated SVM cost 10 gamma 0.01	63.48	81.27	144.75
Nmodels SVM cost 1 gamma 0.001	64.64	80.6	145.24
Iterated SVM cost 50 gamma 0.01	65.01	81.75	146.76
Iterated RF ntree 500	67.12	80.23	147.34
Iterated RF ntree 1500	67.25	80.12	147.37
Iterated RF ntree 1000	67.37	80.48	147.84
Iterated SVM cost 100 gamma 0.01	66.96	83.19	150.15
Iterated QRF ntree 1500	67.83	84.38	152.21
Iterated QRF ntree 1000	67.79	84.56	152.35
Iterated QRF ntree 500	68.16	84.79	152.95
Iterated SVM cost 1 gamma 0.001	66.26	87.2	153.47
Iterated SVM cost 5 gamma 0.05	66.46	88.28	154.74
Iterated SVM cost 10 gamma 0.05	67.9	88.44	156.34
Iterated SVM cost 1 gamma 0.01	65.64	92.78	158.42
Iterated SVM cost 1 gamma 0.05	66.88	94.11	160.98
Iterated SVM cost 50 gamma 0.05	71.59	92.94	164.53
Iterated SVM cost 1 gamma 0.1	71.46	97.22	168.68
Iterated SVM cost 100 gamma 0.05	73.18	95.7	168.88
Iterated SVM cost 5 gamma 0.1	74.66	97.89	172.55
Iterated SVM cost 10 gamma 0.1	75.25	99.55	174.8
Iterated SVM cost 50 gamma 0.1	76.2	102.34	178.54

Iterated SVM cost 100 gamma 0.1	76.61	103.13	179.74
RW	176.03	228.46	404.48

Table 2.14: All setups TQE



### 2.5.3 Utility

Figure 2.15 shows the results using the Utility error measure (larger is better) for all different setups.

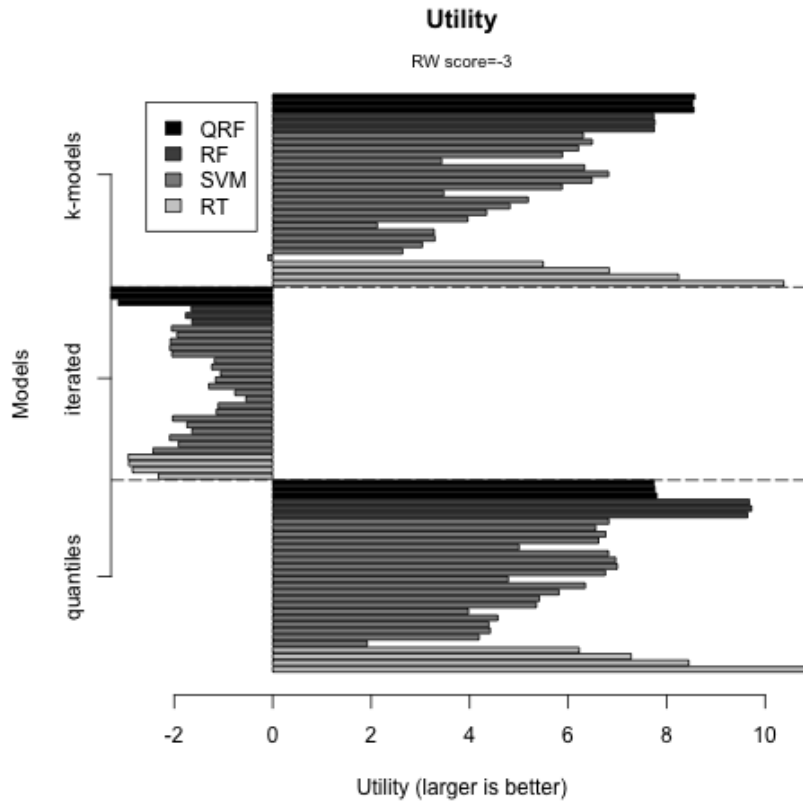


Figure 2.15: Stream 5

Table 2.15 shows all setups order by the Utility.

	utility
Quantile RT se 0	10.97
Nmodels RT se 0	10.38
Quantile RF ntree 1000	9.72
Quantile RF ntree 1500	9.68
Quantile RF ntree 500	9.64
Nmodels QRF ntree 1500	8.57
Nmodels QRF ntree 500	8.56

Nmodels QRF ntree 1000	8.53
Quantile RT se 0.5	8.45
Nmodels RT se 0.5	8.24
Quantile QRF ntree 500	7.8
Quantile QRF ntree 1000	7.76
Nmodels RF ntree 1000	7.76
Nmodels RF ntree 500	7.75
Quantile QRF ntree 1500	7.74
Nmodels RF ntree 1500	7.74
Quantile RT se 1	7.28
Quantile SVM cost 10 gamma 0.05	7
Quantile SVM cost 50 gamma 0.05	6.97
Nmodels RT se 1	6.83
Quantile SVM cost 100 gamma 0.1	6.83
Quantile SVM cost 100 gamma 0.05	6.82
Nmodels SVM cost 50 gamma 0.05	6.82
Quantile SVM cost 10 gamma 0.1	6.76
Quantile SVM cost 5 gamma 0.05	6.76
Quantile SVM cost 5 gamma 0.1	6.62
Quantile SVM cost 50 gamma 0.1	6.56
Nmodels SVM cost 50 gamma 0.1	6.49
Nmodels SVM cost 10 gamma 0.05	6.48
Quantile SVM cost 100 gamma 0.01	6.35
Nmodels SVM cost 100 gamma 0.05	6.33
Nmodels SVM cost 100 gamma 0.1	6.31
Quantile RT se 1.5	6.23
Nmodels SVM cost 10 gamma 0.1	6.21
Nmodels SVM cost 5 gamma 0.1	5.88
Nmodels SVM cost 5 gamma 0.05	5.88
Quantile SVM cost 50 gamma 0.01	5.81
Nmodels RT se 1.5	5.49
Quantile SVM cost 10 gamma 0.01	5.41
Quantile SVM cost 5 gamma 0.01	5.36
Nmodels SVM cost 100 gamma 0.01	5.19
Quantile SVM cost 1 gamma 0.1	5
Nmodels SVM cost 50 gamma 0.01	4.82
Quantile SVM cost 1 gamma 0.05	4.78
Quantile SVM cost 100 gamma 0.001	4.57
Quantile SVM cost 10 gamma 0.001	4.42
Quantile SVM cost 50 gamma 0.001	4.39
Nmodels SVM cost 10 gamma 0.01	4.34

Quantile SVM cost 5 gamma 0.001	4.19
Quantile SVM cost 1 gamma 0.01	3.98
Nmodels SVM cost 5 gamma 0.01	3.96
Nmodels SVM cost 1 gamma 0.05	3.47
Nmodels SVM cost 1 gamma 0.1	3.43
Nmodels SVM cost 50 gamma 0.001	3.29
Nmodels SVM cost 100 gamma 0.001	3.28
Nmodels SVM cost 10 gamma 0.001	3.04
Nmodels SVM cost 5 gamma 0.001	2.64
Nmodels SVM cost 1 gamma 0.01	2.12
Quantile SVM cost 1 gamma 0.001	1.92
Nmodels SVM cost 1 gamma 0.001	-0.09
Iterated SVM cost 50 gamma 0.01	-0.54
Iterated SVM cost 100 gamma 0.01	-0.77
Iterated SVM cost 10 gamma 0.05	-1.06
Iterated SVM cost 10 gamma 0.01	-1.11
Iterated SVM cost 5 gamma 0.01	-1.14
Iterated SVM cost 5 gamma 0.05	-1.16
Iterated SVM cost 100 gamma 0.05	-1.18
Iterated SVM cost 50 gamma 0.05	-1.24
Iterated SVM cost 1 gamma 0.05	-1.3
Iterated SVM cost 50 gamma 0.001	-1.64
Iterated RF ntree 500	-1.64
Iterated RF ntree 1500	-1.65
Iterated SVM cost 100 gamma 0.001	-1.74
Iterated RF ntree 1000	-1.76
Iterated SVM cost 5 gamma 0.001	-1.91
Iterated SVM cost 50 gamma 0.1	-1.94
Iterated SVM cost 1 gamma 0.01	-2.03
Iterated SVM cost 1 gamma 0.1	-2.05
Iterated SVM cost 100 gamma 0.1	-2.05
Iterated SVM cost 10 gamma 0.1	-2.08
Iterated SVM cost 5 gamma 0.1	-2.09
Iterated SVM cost 10 gamma 0.001	-2.09
Iterated RT se 0	-2.32
Iterated SVM cost 1 gamma 0.001	-2.43
Iterated RT se 0.5	-2.85
Iterated RT se 1	-2.92
Iterated RT se 1.5	-2.93
Iterated QRF ntree 500	-3.13
RW	-3.17

Iterated QRF ntree 1500	-3.28
Iterated QRF ntree 1000	-3.28

Table 2.15: All setups Utility

## 2.6 Stream 6

### 2.6.1 MAQ - Mean Absolute Quantile Deviation

Figure 2.16 shows the results using the MAQ error measure for all different setups.

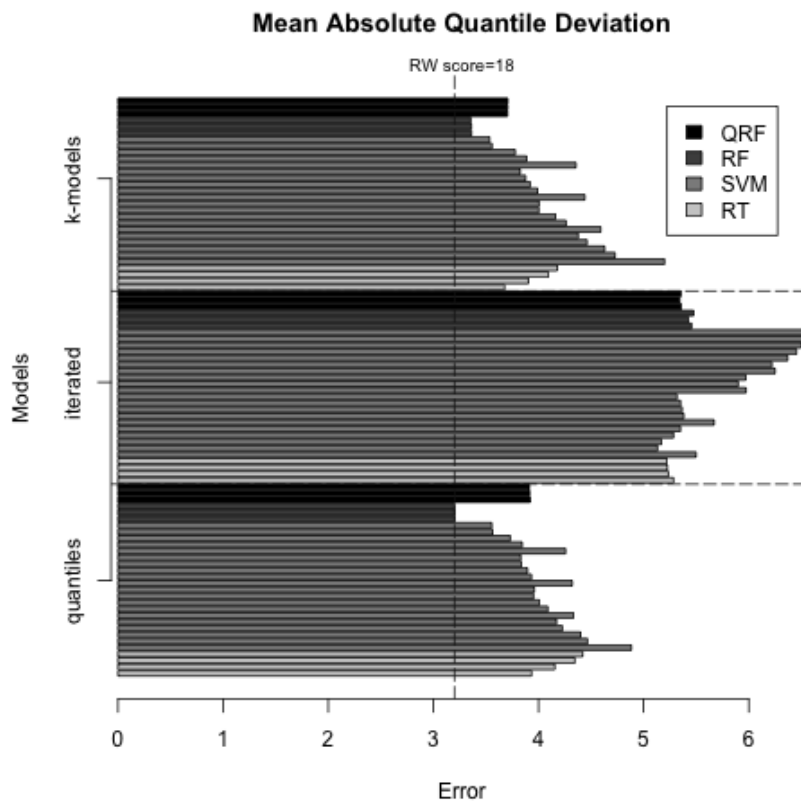


Figure 2.16: Stream 6

Table 2.16 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile RF ntree 1500	3.49	2.91	3.2
Quantile RF ntree 1000	3.49	2.91	3.2
Quantile RF ntree 500	3.5	2.91	3.2
Nmodels RF ntree 1500	3.9	2.82	3.36
Nmodels RF ntree 1000	3.9	2.82	3.36

Nmodels RF ntree 500	3.9	2.82	3.36
Nmodels SVM cost 100 gamma 0.1	3.88	3.18	3.53
Quantile SVM cost 100 gamma 0.1	3.88	3.23	3.56
Nmodels SVM cost 50 gamma 0.1	3.9	3.22	3.56
Quantile SVM cost 50 gamma 0.1	3.92	3.21	3.56
Nmodels RT se 0	3.97	3.38	3.68
Nmodels QRF ntree 500	4.06	3.35	3.71
Nmodels QRF ntree 1000	4.06	3.36	3.71
Nmodels QRF ntree 1500	4.06	3.36	3.71
Quantile SVM cost 10 gamma 0.1	4.14	3.33	3.73
Nmodels SVM cost 10 gamma 0.1	4.19	3.37	3.78
Nmodels SVM cost 100 gamma 0.05	4.16	3.5	3.83
Quantile SVM cost 100 gamma 0.05	4.24	3.42	3.83
Quantile SVM cost 50 gamma 0.05	4.28	3.4	3.84
Quantile SVM cost 5 gamma 0.1	4.28	3.41	3.84
Nmodels SVM cost 50 gamma 0.05	4.19	3.56	3.88
Nmodels SVM cost 5 gamma 0.1	4.35	3.43	3.89
Quantile SVM cost 10 gamma 0.05	4.34	3.45	3.9
Nmodels RT se 0.5	4.17	3.64	3.9
Quantile QRF ntree 1500	4.28	3.54	3.91
Quantile QRF ntree 1000	4.27	3.56	3.92
Nmodels SVM cost 10 gamma 0.05	4.31	3.53	3.92
Quantile QRF ntree 500	4.29	3.56	3.92
Quantile SVM cost 5 gamma 0.05	4.35	3.51	3.93
Quantile RT se 0	3.86	4.01	3.93
Quantile SVM cost 50 gamma 0.01	4.28	3.62	3.95
Quantile SVM cost 100 gamma 0.01	4.32	3.6	3.96
Nmodels SVM cost 5 gamma 0.05	4.45	3.53	3.99
Nmodels SVM cost 50 gamma 0.01	4.5	3.51	4
Nmodels SVM cost 100 gamma 0.01	4.49	3.52	4
Quantile SVM cost 10 gamma 0.01	4.33	3.69	4.01
Quantile SVM cost 5 gamma 0.01	4.41	3.77	4.09
Nmodels RT se 1	4.41	3.78	4.09
Quantile RT se 0.5	4.1	4.21	4.16
Nmodels SVM cost 10 gamma 0.01	4.68	3.64	4.16
Quantile SVM cost 100 gamma 0.001	4.46	3.88	4.17
Nmodels RT se 1.5	4.52	3.83	4.18
Quantile SVM cost 50 gamma 0.001	4.53	3.93	4.23
Quantile SVM cost 1 gamma 0.1	4.71	3.81	4.26
Nmodels SVM cost 5 gamma 0.01	4.74	3.79	4.26
Quantile SVM cost 1 gamma 0.05	4.72	3.92	4.32

Quantile SVM cost 1 gamma 0.01	4.67	3.99	4.33
Quantile RT se 1	4.28	4.41	4.35
Nmodels SVM cost 1 gamma 0.1	4.93	3.78	4.36
Nmodels SVM cost 100 gamma 0.001	4.8	3.96	4.38
Quantile SVM cost 10 gamma 0.001	4.71	4.09	4.4
Quantile RT se 1.5	4.42	4.42	4.42
Nmodels SVM cost 1 gamma 0.05	5.05	3.83	4.44
Nmodels SVM cost 50 gamma 0.001	4.88	4.05	4.46
Quantile SVM cost 5 gamma 0.001	4.77	4.16	4.47
Nmodels SVM cost 1 gamma 0.01	4.99	4.2	4.59
Nmodels SVM cost 10 gamma 0.001	5.07	4.19	4.63
Nmodels SVM cost 5 gamma 0.001	5.23	4.23	4.73
Quantile SVM cost 1 gamma 0.001	5.18	4.59	4.88
Iterated SVM cost 5 gamma 0.001	5.61	4.66	5.13
Iterated SVM cost 10 gamma 0.001	5.65	4.69	5.17
Nmodels SVM cost 1 gamma 0.001	5.79	4.61	5.2
Iterated RT se 1.5	5.83	4.61	5.22
Iterated RT se 1	5.85	4.6	5.23
Iterated RT se 0.5	5.86	4.61	5.23
Iterated RT se 0	5.88	4.69	5.28
Iterated SVM cost 50 gamma 0.001	5.7	4.87	5.28
Iterated SVM cost 100 gamma 0.01	5.64	5	5.32
Iterated QRF ntree 1000	5.8	4.89	5.34
Iterated SVM cost 100 gamma 0.001	5.8	4.9	5.35
Iterated SVM cost 50 gamma 0.01	5.74	4.96	5.35
Iterated QRF ntree 1500	5.81	4.9	5.35
Iterated QRF ntree 500	5.81	4.9	5.36
Iterated SVM cost 10 gamma 0.01	5.75	4.98	5.37
Iterated SVM cost 5 gamma 0.01	5.77	4.99	5.38
Iterated RF ntree 1000	6.08	4.78	5.43
Iterated RF ntree 500	6.1	4.81	5.46
Iterated RF ntree 1500	6.14	4.81	5.47
Iterated SVM cost 1 gamma 0.001	6.1	4.9	5.5
Iterated SVM cost 1 gamma 0.01	6.05	5.29	5.67
Iterated SVM cost 5 gamma 0.05	6.32	5.48	5.9
Iterated SVM cost 10 gamma 0.05	6.25	5.69	5.97
Iterated SVM cost 1 gamma 0.05	6.27	5.67	5.97
Iterated SVM cost 100 gamma 0.05	6.39	6.05	6.22
Iterated SVM cost 50 gamma 0.05	6.37	6.13	6.25
Iterated SVM cost 1 gamma 0.1	6.71	6.03	6.37
Iterated SVM cost 5 gamma 0.1	6.74	6.16	6.45

Iterated SVM cost 10 gamma 0.1	6.79	6.21	6.5
Iterated SVM cost 50 gamma 0.1	6.8	6.34	6.57
Iterated SVM cost 100 gamma 0.1	6.81	6.41	6.61
RW	17.61	18.81	18.21

Table 2.16: All setups MAQ



## 2.6.2 TQE - Total Quantile Error

Figure 2.17 shows the results using the TQE error measure for all different setups.

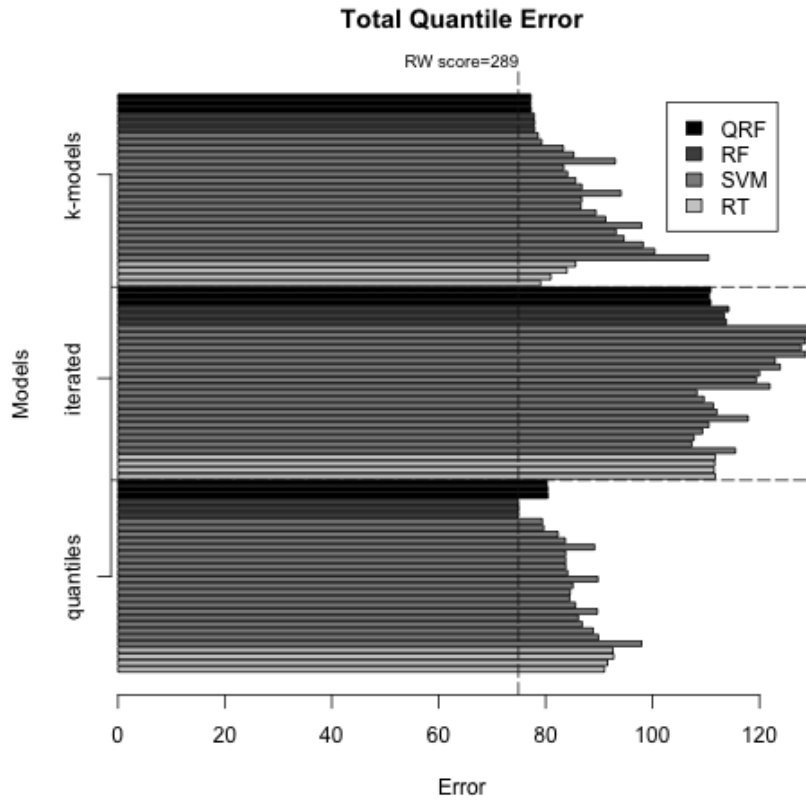


Figure 2.17: Stream 6

Table 2.17 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile RF ntree 1500	39.52	35.37	74.89
Quantile RF ntree 500	39.55	35.35	74.9
Quantile RF ntree 1000	39.55	35.38	74.93
Nmodels QRF ntree 1000	40.65	36.56	77.21
Nmodels QRF ntree 1500	40.67	36.56	77.23
Nmodels QRF ntree 500	40.69	36.58	77.27
Nmodels RF ntree 1500	42.54	35.33	77.87

Nmodels RF ntree 1000	42.58	35.35	77.93
Nmodels RF ntree 500	42.57	35.37	77.94
Nmodels SVM cost 100 gamma 0.1	42.34	36.24	78.57
Nmodels RT se 0	40.97	38.07	79.04
Nmodels SVM cost 50 gamma 0.1	42.8	36.46	79.26
Quantile SVM cost 100 gamma 0.1	42.46	36.91	79.38
Quantile SVM cost 50 gamma 0.1	42.82	36.83	79.66
Quantile QRF ntree 1500	41.96	38.31	80.27
Quantile QRF ntree 1000	41.92	38.46	80.38
Quantile QRF ntree 500	42	38.41	80.41
Nmodels RT se 0.5	41.63	39.35	80.98
Quantile SVM cost 10 gamma 0.1	44.6	37.71	82.31
Nmodels SVM cost 10 gamma 0.1	44.99	38.33	83.32
Nmodels SVM cost 100 gamma 0.05	44.74	38.62	83.36
Quantile SVM cost 5 gamma 0.1	45.4	38.28	83.68
Quantile SVM cost 100 gamma 0.05	45.46	38.27	83.73
Quantile SVM cost 50 gamma 0.05	45.69	38.04	83.73
Quantile SVM cost 10 gamma 0.05	45.75	38	83.75
Nmodels RT se 1	43.36	40.6	83.96
Nmodels SVM cost 50 gamma 0.05	44.87	39.23	84.09
Quantile SVM cost 5 gamma 0.05	45.6	38.5	84.1
Quantile SVM cost 10 gamma 0.01	45.11	39.38	84.49
Quantile SVM cost 50 gamma 0.01	45.8	38.78	84.58
Quantile SVM cost 100 gamma 0.01	46.45	38.64	85.09
Nmodels SVM cost 5 gamma 0.1	46.18	39.05	85.23
Quantile SVM cost 5 gamma 0.01	45.65	39.92	85.57
Nmodels RT se 1.5	44.44	41.15	85.59
Nmodels SVM cost 10 gamma 0.05	45.89	39.7	85.6
Quantile SVM cost 100 gamma 0.001	45.31	40.79	86.1
Nmodels SVM cost 50 gamma 0.01	47.34	39.25	86.6
Nmodels SVM cost 100 gamma 0.01	47.55	39.19	86.74
Nmodels SVM cost 5 gamma 0.05	46.9	39.87	86.76
Quantile SVM cost 50 gamma 0.001	45.75	41.08	86.83
Quantile SVM cost 10 gamma 0.001	47.45	41.45	88.9
Quantile SVM cost 1 gamma 0.1	48.09	41.07	89.16
Nmodels SVM cost 10 gamma 0.01	48.68	40.72	89.4
Quantile SVM cost 1 gamma 0.01	48.22	41.46	89.68
Quantile SVM cost 1 gamma 0.05	48.49	41.3	89.78
Quantile SVM cost 5 gamma 0.001	48.4	41.47	89.86
Quantile RT se 0	45.19	45.8	90.99
Nmodels SVM cost 5 gamma 0.01	49.41	41.82	91.24

Quantile RT se 0.5	45.62	45.94	91.56
Quantile RT se 1.5	46.15	46.44	92.59
Quantile RT se 1	45.83	46.91	92.75
Nmodels SVM cost 1 gamma 0.1	50.74	42.29	93.03
Nmodels SVM cost 100 gamma 0.001	49.57	43.58	93.15
Nmodels SVM cost 1 gamma 0.05	52.09	42.02	94.11
Nmodels SVM cost 50 gamma 0.001	50.27	44.37	94.64
Nmodels SVM cost 1 gamma 0.01	52.84	45.1	97.94
Quantile SVM cost 1 gamma 0.001	53.98	43.99	97.96
Nmodels SVM cost 10 gamma 0.001	53.09	45.14	98.23
Nmodels SVM cost 5 gamma 0.001	55.32	45.08	100.4
Iterated SVM cost 5 gamma 0.001	59.03	48.3	107.33
Iterated SVM cost 10 gamma 0.001	59.42	48.34	107.76
Iterated SVM cost 100 gamma 0.01	57.3	50.99	108.29
Iterated SVM cost 50 gamma 0.001	60.13	49.2	109.33
Iterated SVM cost 50 gamma 0.01	58.57	51.04	109.61
Nmodels SVM cost 1 gamma 0.001	62.85	47.61	110.47
Iterated SVM cost 100 gamma 0.001	60.42	50.11	110.53
Iterated QRF ntree 1000	58.72	51.88	110.6
Iterated QRF ntree 1500	58.79	52.08	110.88
Iterated QRF ntree 500	58.87	52.01	110.89
Iterated SVM cost 10 gamma 0.01	59.66	51.7	111.36
Iterated RT se 0.5	62.08	49.44	111.52
Iterated RT se 1	62.21	49.41	111.62
Iterated RT se 1.5	62.19	49.52	111.72
Iterated RT se 0	61.72	50	111.72
Iterated SVM cost 5 gamma 0.01	60.2	51.82	112.02
Iterated RF ntree 1000	62.54	50.87	113.41
Iterated RF ntree 500	62.64	51.15	113.79
Iterated RF ntree 1500	63.07	51.17	114.24
Iterated SVM cost 1 gamma 0.001	65.44	50.05	115.5
Iterated SVM cost 1 gamma 0.01	63.25	54.63	117.87
Iterated SVM cost 5 gamma 0.05	63.52	55.86	119.39
Iterated SVM cost 10 gamma 0.05	63.67	56.34	120
Iterated SVM cost 1 gamma 0.05	63.89	58.05	121.94
Iterated SVM cost 100 gamma 0.05	65.5	57.42	122.93
Iterated SVM cost 50 gamma 0.05	65.87	57.99	123.86
Iterated SVM cost 5 gamma 0.1	67.23	60.54	127.77
Iterated SVM cost 10 gamma 0.1	68.15	60.4	128.56
Iterated SVM cost 1 gamma 0.1	67.21	61.45	128.66
Iterated SVM cost 50 gamma 0.1	68.9	60.46	129.36

Iterated SVM cost 100 gamma 0.1	69.05	60.9	129.95
RW	150.21	138.97	289.18

Table 2.17: All setups TQE

### 2.6.3 Utility

Figure 2.18 shows the results using the Utility error measure (larger is better) for all different setups.

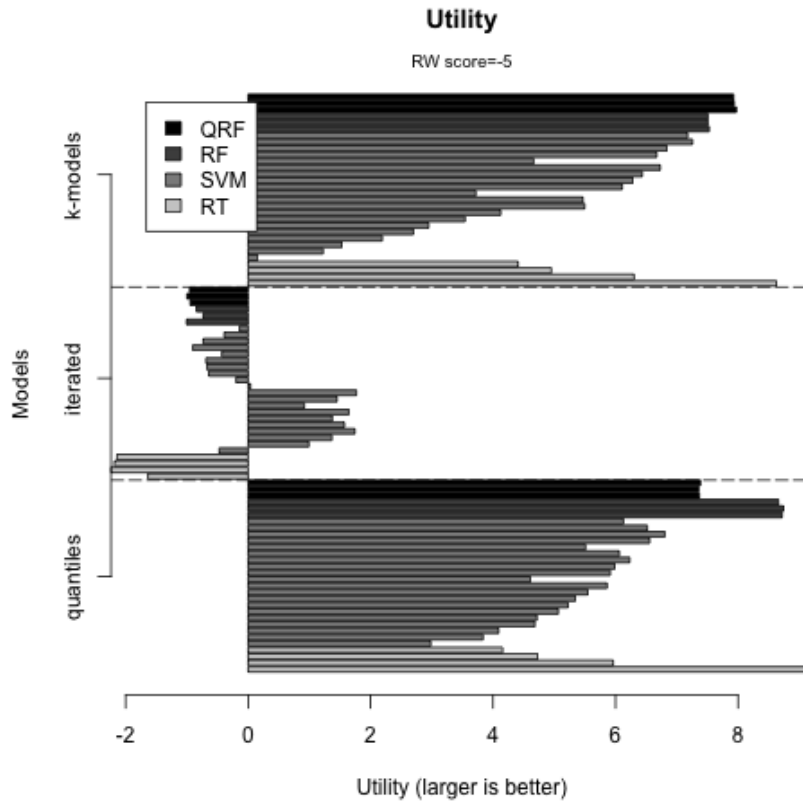


Figure 2.18: Stream 6

Table 2.18 shows all setups order by the Utility.

	utility
Quantile RT se 0	9.22
Quantile RF ntree 1000	8.74
Quantile RF ntree 500	8.72
Quantile RF ntree 1500	8.66
Nmodels RT se 0	8.63
Nmodels QRF ntree 500	7.97
Nmodels QRF ntree 1000	7.94

Nmodels QRF ntree 1500	7.93
Nmodels RF ntree 500	7.53
Nmodels RF ntree 1500	7.51
Nmodels RF ntree 1000	7.51
Quantile QRF ntree 1500	7.39
Quantile QRF ntree 500	7.37
Quantile QRF ntree 1000	7.36
Nmodels SVM cost 50 gamma 0.1	7.26
Nmodels SVM cost 100 gamma 0.1	7.18
Nmodels SVM cost 10 gamma 0.1	6.84
Quantile SVM cost 10 gamma 0.1	6.8
Nmodels SVM cost 100 gamma 0.05	6.73
Nmodels SVM cost 5 gamma 0.1	6.67
Quantile SVM cost 5 gamma 0.1	6.56
Quantile SVM cost 50 gamma 0.1	6.52
Nmodels SVM cost 50 gamma 0.05	6.44
Nmodels RT se 0.5	6.3
Nmodels SVM cost 10 gamma 0.05	6.28
Quantile SVM cost 50 gamma 0.05	6.23
Quantile SVM cost 100 gamma 0.1	6.13
Nmodels SVM cost 5 gamma 0.05	6.11
Quantile SVM cost 100 gamma 0.05	6.06
Quantile SVM cost 10 gamma 0.05	5.99
Quantile RT se 0.5	5.96
Quantile SVM cost 5 gamma 0.05	5.91
Quantile SVM cost 100 gamma 0.01	5.86
Quantile SVM cost 50 gamma 0.01	5.55
Quantile SVM cost 1 gamma 0.1	5.51
Nmodels SVM cost 50 gamma 0.01	5.5
Nmodels SVM cost 100 gamma 0.01	5.47
Quantile SVM cost 10 gamma 0.01	5.34
Quantile SVM cost 5 gamma 0.01	5.22
Quantile SVM cost 1 gamma 0.01	5.07
Nmodels RT se 1	4.95
Quantile RT se 1	4.73
Quantile SVM cost 100 gamma 0.001	4.72
Quantile SVM cost 50 gamma 0.001	4.68
Nmodels SVM cost 1 gamma 0.1	4.66
Quantile SVM cost 1 gamma 0.05	4.61
Nmodels RT se 1.5	4.41
Quantile RT se 1.5	4.16

Nmodels SVM cost 10 gamma 0.01	4.13
Quantile SVM cost 10 gamma 0.001	4.09
Quantile SVM cost 5 gamma 0.001	3.84
Nmodels SVM cost 1 gamma 0.05	3.72
Nmodels SVM cost 5 gamma 0.01	3.54
Quantile SVM cost 1 gamma 0.001	2.98
Nmodels SVM cost 1 gamma 0.01	2.95
Nmodels SVM cost 100 gamma 0.001	2.7
Nmodels SVM cost 50 gamma 0.001	2.19
Iterated SVM cost 100 gamma 0.01	1.77
Iterated SVM cost 50 gamma 0.001	1.74
Iterated SVM cost 5 gamma 0.01	1.64
Iterated SVM cost 100 gamma 0.001	1.57
Nmodels SVM cost 10 gamma 0.001	1.53
Iterated SVM cost 50 gamma 0.01	1.45
Iterated SVM cost 1 gamma 0.01	1.37
Iterated SVM cost 10 gamma 0.001	1.37
Nmodels SVM cost 5 gamma 0.001	1.23
Iterated SVM cost 5 gamma 0.001	0.99
Iterated SVM cost 10 gamma 0.01	0.92
Nmodels SVM cost 1 gamma 0.001	0.15
Iterated SVM cost 1 gamma 0.05	0.04
Iterated SVM cost 100 gamma 0.1	-0.14
Iterated SVM cost 5 gamma 0.05	-0.2
Iterated SVM cost 50 gamma 0.1	-0.39
Iterated SVM cost 1 gamma 0.1	-0.43
Iterated SVM cost 1 gamma 0.001	-0.47
Iterated SVM cost 10 gamma 0.05	-0.64
Iterated SVM cost 50 gamma 0.05	-0.67
Iterated SVM cost 100 gamma 0.05	-0.69
Iterated SVM cost 10 gamma 0.1	-0.73
Iterated RF ntree 1000	-0.73
Iterated RF ntree 1500	-0.84
Iterated SVM cost 5 gamma 0.1	-0.9
Iterated QRF ntree 500	-0.94
Iterated QRF ntree 1500	-0.95
Iterated QRF ntree 1000	-1
Iterated RF ntree 500	-1.01
Iterated RT se 0	-1.64
Iterated RT se 1.5	-2.14
Iterated RT se 1	-2.18

Iterated RT se 0.5	-2.24
RW	-4.71

Table 2.18: All setups Utility



## 2.7 Stream 7

### 2.7.1 MAQ - Mean Absolute Quantile Deviation

Figure 2.19 shows the results using the MAQ error measure for all different setups.

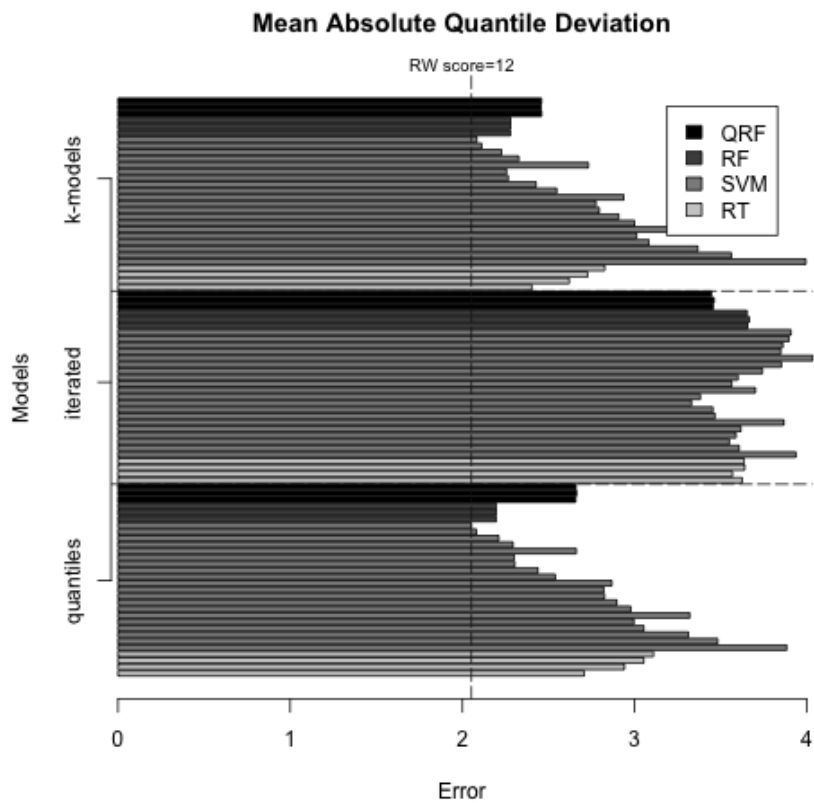


Figure 2.19: Stream 7

Table 2.19 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile SVM cost 100 gamma 0.1	1.98	2.12	2.05
Quantile SVM cost 50 gamma 0.1	2.01	2.16	2.08
Nmodels SVM cost 100 gamma 0.1	2.1	2.07	2.08
Nmodels SVM cost 50 gamma 0.1	2.13	2.09	2.11
Quantile RF ntree 500	2.18	2.22	2.2

Quantile RF ntree 1500	2.17	2.22	2.2
Quantile RF ntree 1000	2.17	2.22	2.2
Quantile SVM cost 10 gamma 0.1	2.12	2.31	2.21
Nmodels SVM cost 10 gamma 0.1	2.27	2.18	2.23
Nmodels SVM cost 100 gamma 0.05	2.32	2.19	2.26
Nmodels SVM cost 50 gamma 0.05	2.35	2.18	2.27
Nmodels RF ntree 500	2.46	2.09	2.28
Nmodels RF ntree 1000	2.46	2.1	2.28
Nmodels RF ntree 1500	2.46	2.09	2.28
Quantile SVM cost 5 gamma 0.1	2.2	2.38	2.29
Quantile SVM cost 100 gamma 0.05	2.19	2.41	2.3
Quantile SVM cost 50 gamma 0.05	2.21	2.4	2.3
Nmodels SVM cost 5 gamma 0.1	2.38	2.27	2.33
Nmodels RT se 0	2.22	2.58	2.4
Nmodels SVM cost 10 gamma 0.05	2.56	2.3	2.43
Quantile SVM cost 10 gamma 0.05	2.38	2.5	2.44
Nmodels QRF ntree 1000	2.15	2.76	2.46
Nmodels QRF ntree 1500	2.15	2.77	2.46
Nmodels QRF ntree 500	2.15	2.77	2.46
Quantile SVM cost 5 gamma 0.05	2.48	2.6	2.54
Nmodels SVM cost 5 gamma 0.05	2.68	2.41	2.55
Nmodels RT se 0.5	2.48	2.76	2.62
Quantile QRF ntree 500	2.33	2.98	2.66
Quantile QRF ntree 1500	2.34	2.98	2.66
Quantile SVM cost 1 gamma 0.1	2.58	2.74	2.66
Quantile QRF ntree 1000	2.33	2.99	2.66
Quantile RT se 0	2.64	2.77	2.71
Nmodels RT se 1	2.56	2.9	2.73
Nmodels SVM cost 1 gamma 0.1	2.84	2.62	2.73
Nmodels SVM cost 100 gamma 0.01	2.85	2.7	2.77
Nmodels SVM cost 50 gamma 0.01	2.9	2.69	2.79
Quantile SVM cost 100 gamma 0.01	2.68	2.96	2.82
Quantile SVM cost 50 gamma 0.01	2.7	2.95	2.82
Nmodels RT se 1.5	2.67	2.99	2.83
Quantile SVM cost 1 gamma 0.05	2.84	2.9	2.87
Quantile SVM cost 10 gamma 0.01	2.82	2.97	2.9
Nmodels SVM cost 10 gamma 0.01	3.09	2.72	2.91
Nmodels SVM cost 1 gamma 0.05	3.06	2.81	2.94
Quantile RT se 0.5	2.84	3.05	2.94
Quantile SVM cost 5 gamma 0.01	2.91	3.04	2.98
Quantile SVM cost 100 gamma 0.001	2.95	3.04	3

Nmodels SVM cost 5 gamma 0.01	3.22	2.78	3
Nmodels SVM cost 100 gamma 0.001	3.24	2.78	3.01
Quantile RT se 1	2.96	3.15	3.05
Quantile SVM cost 50 gamma 0.001	3.04	3.06	3.05
Nmodels SVM cost 50 gamma 0.001	3.36	2.81	3.08
Quantile RT se 1.5	2.99	3.23	3.11
Quantile SVM cost 10 gamma 0.001	3.33	3.3	3.31
Quantile SVM cost 1 gamma 0.01	3.3	3.34	3.32
Iterated SVM cost 50 gamma 0.01	3.5	3.16	3.33
Nmodels SVM cost 10 gamma 0.001	3.75	2.99	3.37
Nmodels SVM cost 1 gamma 0.01	3.7	3.06	3.38
Iterated SVM cost 100 gamma 0.01	3.53	3.23	3.38
Iterated QRF ntree 1500	3.62	3.27	3.45
Iterated SVM cost 10 gamma 0.01	3.62	3.29	3.45
Iterated QRF ntree 500	3.63	3.28	3.46
Iterated QRF ntree 1000	3.63	3.29	3.46
Iterated SVM cost 5 gamma 0.01	3.59	3.35	3.47
Quantile SVM cost 5 gamma 0.001	3.5	3.46	3.48
Iterated SVM cost 10 gamma 0.001	3.77	3.33	3.55
Nmodels SVM cost 5 gamma 0.001	3.94	3.18	3.56
Iterated SVM cost 5 gamma 0.05	3.67	3.46	3.56
Iterated RT se 0.5	3.92	3.22	3.57
Iterated SVM cost 50 gamma 0.001	3.77	3.4	3.59
Iterated SVM cost 10 gamma 0.05	3.69	3.51	3.6
Iterated SVM cost 5 gamma 0.001	3.87	3.35	3.61
Iterated SVM cost 100 gamma 0.001	3.78	3.46	3.62
Iterated RT se 0	3.94	3.31	3.62
Iterated RT se 1.5	4.03	3.24	3.64
Iterated RT se 1	4.03	3.25	3.64
Iterated RF ntree 1500	3.95	3.35	3.65
Iterated RF ntree 500	3.96	3.35	3.66
Iterated RF ntree 1000	3.97	3.36	3.67
Iterated SVM cost 1 gamma 0.05	3.84	3.56	3.7
Iterated SVM cost 50 gamma 0.05	3.79	3.69	3.74
Iterated SVM cost 5 gamma 0.1	3.89	3.8	3.85
Iterated SVM cost 100 gamma 0.05	3.86	3.84	3.85
Iterated SVM cost 10 gamma 0.1	3.9	3.82	3.86
Iterated SVM cost 1 gamma 0.01	3.94	3.79	3.87
Quantile SVM cost 1 gamma 0.001	3.86	3.9	3.88
Iterated SVM cost 50 gamma 0.1	3.91	3.88	3.9
Iterated SVM cost 100 gamma 0.1	3.87	3.94	3.91

Iterated SVM cost 1 gamma 0.001	4.3	3.57	3.94
Nmodels SVM cost 1 gamma 0.001	4.3	3.69	3.99
Iterated SVM cost 1 gamma 0.1	3.97	4.09	4.03
RW	13.47	10.12	11.8

Table 2.19: All setups MAQ

## 2.7.2 TQE - Total Quantile Error

Figure 2.20 shows the results using the TQE error measure for all different setups.

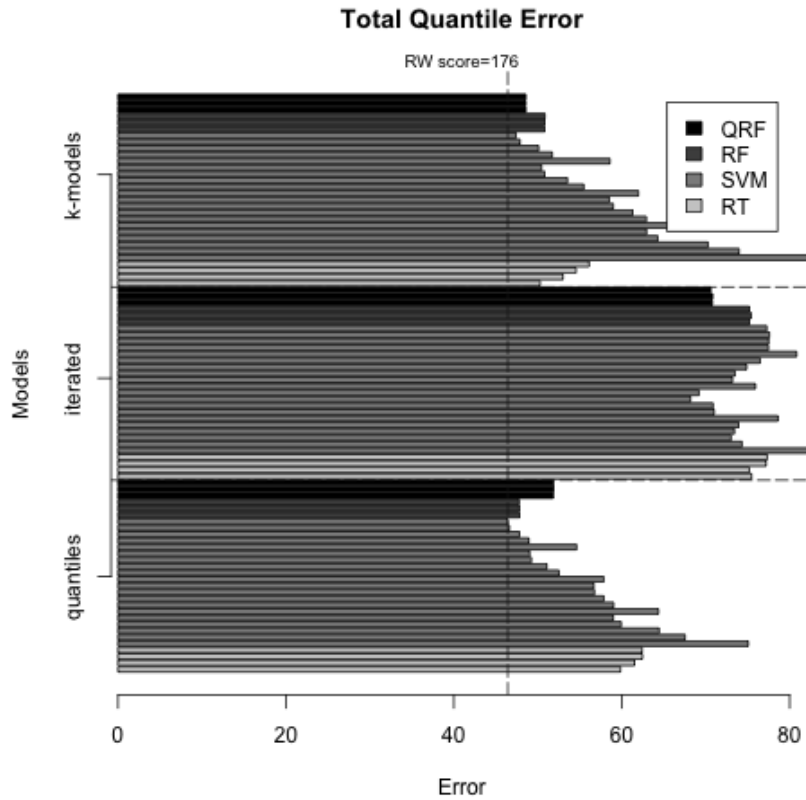


Figure 2.20: Stream 7

Table 2.20 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile SVM cost 100 gamma 0.1	23.1	23.33	46.43
Quantile SVM cost 50 gamma 0.1	23.27	23.35	46.62
Nmodels SVM cost 100 gamma 0.1	24.22	23.17	47.39
Quantile RF ntree 1500	25.25	22.52	47.78
Quantile RF ntree 1000	25.28	22.52	47.8
Quantile SVM cost 10 gamma 0.1	24.08	23.73	47.8
Quantile RF ntree 500	25.33	22.5	47.83

Nmodels SVM cost 50 gamma 0.1	24.64	23.23	47.87
Nmodels QRF ntree 1000	23.33	25.24	48.57
Nmodels QRF ntree 1500	23.33	25.25	48.58
Nmodels QRF ntree 500	23.32	25.26	48.58
Quantile SVM cost 5 gamma 0.1	24.84	24.1	48.93
Quantile SVM cost 100 gamma 0.05	24.62	24.41	49.03
Quantile SVM cost 50 gamma 0.05	24.86	24.37	49.23
Nmodels SVM cost 10 gamma 0.1	26.39	23.7	50.09
Nmodels RT se 0	25.69	24.57	50.27
Nmodels SVM cost 100 gamma 0.05	26.55	23.88	50.44
Nmodels RF ntree 1000	28.51	22.3	50.81
Nmodels RF ntree 500	28.56	22.28	50.84
Nmodels SVM cost 50 gamma 0.05	26.99	23.85	50.84
Nmodels RF ntree 1500	28.55	22.29	50.84
Quantile SVM cost 10 gamma 0.05	26.1	24.97	51.07
Nmodels SVM cost 5 gamma 0.1	27.5	24.21	51.71
Quantile QRF ntree 500	25.28	26.56	51.84
Quantile QRF ntree 1500	25.3	26.56	51.86
Quantile QRF ntree 1000	25.25	26.64	51.89
Quantile SVM cost 5 gamma 0.05	26.94	25.58	52.52
Nmodels RT se 0.5	27.62	25.38	53
Nmodels SVM cost 10 gamma 0.05	28.7	24.83	53.53
Nmodels RT se 1	28.44	26.12	54.55
Quantile SVM cost 1 gamma 0.1	28.52	26.1	54.62
Nmodels SVM cost 5 gamma 0.05	29.85	25.62	55.47
Nmodels RT se 1.5	29.33	26.78	56.11
Quantile SVM cost 100 gamma 0.01	28.38	28.3	56.68
Quantile SVM cost 50 gamma 0.01	28.42	28.32	56.74
Quantile SVM cost 1 gamma 0.05	30.56	27.29	57.85
Quantile SVM cost 10 gamma 0.01	29.45	28.41	57.85
Nmodels SVM cost 100 gamma 0.01	30.59	27.9	58.49
Nmodels SVM cost 1 gamma 0.1	32.13	26.45	58.58
Nmodels SVM cost 50 gamma 0.01	31.06	27.92	58.98
Quantile SVM cost 100 gamma 0.001	30.49	28.5	58.99
Quantile SVM cost 5 gamma 0.01	30.38	28.65	59.03
Quantile RT se 0	32.44	27.4	59.84
Quantile SVM cost 50 gamma 0.001	31.38	28.55	59.93
Nmodels SVM cost 10 gamma 0.01	33.2	28.1	61.3
Quantile RT se 0.5	33.25	28.27	61.51
Nmodels SVM cost 1 gamma 0.05	33.97	28	61.97
Quantile RT se 1.5	33.45	28.97	62.42

Quantile RT se 1	33.81	28.66	62.47
Nmodels SVM cost 5 gamma 0.01	34.58	28.34	62.92
Nmodels SVM cost 100 gamma 0.001	34.58	28.37	62.95
Nmodels SVM cost 50 gamma 0.001	35.93	28.35	64.28
Quantile SVM cost 1 gamma 0.01	34.87	29.5	64.37
Quantile SVM cost 10 gamma 0.001	35.04	29.41	64.45
Quantile SVM cost 5 gamma 0.001	37.5	30.04	67.54
Iterated SVM cost 50 gamma 0.01	37.78	30.4	68.18
Iterated SVM cost 100 gamma 0.01	38.37	30.82	69.19
Nmodels SVM cost 1 gamma 0.01	40.84	29.42	70.25
Nmodels SVM cost 10 gamma 0.001	41.27	28.99	70.26
Iterated QRF ntree 1500	39.5	31.1	70.61
Iterated QRF ntree 500	39.65	31.14	70.79
Iterated QRF ntree 1000	39.64	31.18	70.82
Iterated SVM cost 10 gamma 0.01	39.99	30.87	70.87
Iterated SVM cost 5 gamma 0.01	39.81	31.19	71
Iterated SVM cost 10 gamma 0.001	42.13	30.87	73.01
Iterated SVM cost 5 gamma 0.05	41.15	32.02	73.18
Iterated SVM cost 50 gamma 0.001	41.9	31.51	73.41
Iterated SVM cost 10 gamma 0.05	41.2	32.27	73.47
Iterated SVM cost 100 gamma 0.001	41.84	32.07	73.91
Nmodels SVM cost 5 gamma 0.001	44.19	29.77	73.97
Iterated SVM cost 5 gamma 0.001	43.38	30.93	74.31
Iterated SVM cost 50 gamma 0.05	41.65	33.22	74.87
Quantile SVM cost 1 gamma 0.001	42.99	32.08	75.06
Iterated RT se 0.5	43.94	31.23	75.18
Iterated RF ntree 500	44.39	30.81	75.2
Iterated RF ntree 1500	44.38	30.82	75.21
Iterated RF ntree 1000	44.5	30.93	75.43
Iterated RT se 0	43.36	32.1	75.46
Iterated SVM cost 1 gamma 0.05	43.14	32.78	75.92
Iterated SVM cost 100 gamma 0.05	42.66	33.81	76.47
Iterated RT se 1	45.48	31.71	77.19
Iterated SVM cost 100 gamma 0.1	42.8	34.46	77.26
Iterated RT se 1.5	45.52	31.79	77.31
Iterated SVM cost 5 gamma 0.1	43.54	33.92	77.46
Iterated SVM cost 10 gamma 0.1	43.4	34.09	77.49
Iterated SVM cost 50 gamma 0.1	43.38	34.19	77.57
Iterated SVM cost 1 gamma 0.01	44.63	33.97	78.6
Iterated SVM cost 1 gamma 0.1	45.21	35.6	80.82
Iterated SVM cost 1 gamma 0.001	49.8	32.47	82.27

Nmodels SVM cost 1 gamma 0.001	49.96	32.78	82.73
RW	98.98	76.52	175.5

Table 2.20: All setups TQE



### 2.7.3 Utility

Figure 2.21 shows the results using the Utility error measure (larger is better) for all different setups.

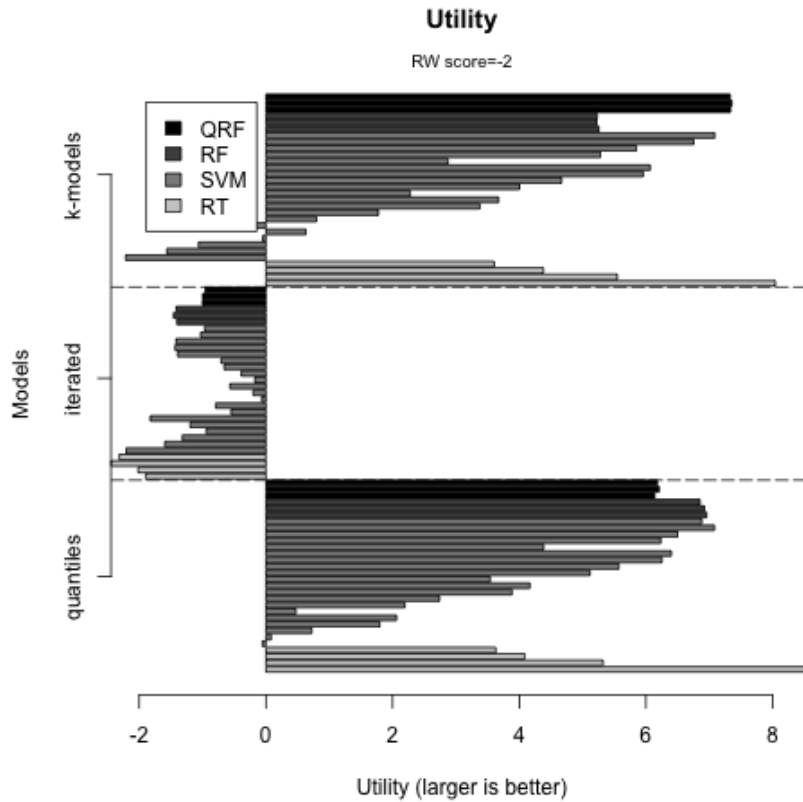


Figure 2.21: Stream 7

Table 2.21 shows all setups order by the Utility.

	utility
Quantile RT se 0	8.63
Nmodels RT se 0	8.04
Nmodels QRF ntree 1000	7.36
Nmodels QRF ntree 500	7.34
Nmodels QRF ntree 1500	7.33
Nmodels SVM cost 100 gamma 0.1	7.09
Quantile SVM cost 50 gamma 0.1	7.08

Quantile RF ntree 500	6.96
Quantile RF ntree 1000	6.92
Quantile SVM cost 100 gamma 0.1	6.88
Quantile RF ntree 1500	6.85
Nmodels SVM cost 50 gamma 0.1	6.76
Quantile SVM cost 10 gamma 0.1	6.5
Quantile SVM cost 100 gamma 0.05	6.4
Quantile SVM cost 50 gamma 0.05	6.25
Quantile SVM cost 5 gamma 0.1	6.24
Quantile QRF ntree 1000	6.21
Quantile QRF ntree 1500	6.18
Quantile QRF ntree 500	6.14
Nmodels SVM cost 100 gamma 0.05	6.07
Nmodels SVM cost 50 gamma 0.05	5.96
Nmodels SVM cost 10 gamma 0.1	5.85
Quantile SVM cost 10 gamma 0.05	5.57
Nmodels RT se 0.5	5.55
Quantile RT se 0.5	5.32
Nmodels SVM cost 5 gamma 0.1	5.28
Nmodels RF ntree 500	5.26
Nmodels RF ntree 1500	5.23
Nmodels RF ntree 1000	5.23
Quantile SVM cost 5 gamma 0.05	5.12
Nmodels SVM cost 10 gamma 0.05	4.67
Quantile SVM cost 1 gamma 0.1	4.39
Nmodels RT se 1	4.38
Quantile SVM cost 100 gamma 0.01	4.17
Quantile RT se 1	4.09
Nmodels SVM cost 5 gamma 0.05	4
Quantile SVM cost 50 gamma 0.01	3.88
Nmodels SVM cost 100 gamma 0.01	3.67
Quantile RT se 1.5	3.63
Nmodels RT se 1.5	3.6
Quantile SVM cost 1 gamma 0.05	3.54
Nmodels SVM cost 50 gamma 0.01	3.38
Nmodels SVM cost 1 gamma 0.1	2.88
Quantile SVM cost 10 gamma 0.01	2.74
Nmodels SVM cost 1 gamma 0.05	2.28
Quantile SVM cost 5 gamma 0.01	2.19
Quantile SVM cost 100 gamma 0.001	2.06
Quantile SVM cost 50 gamma 0.001	1.8

Nmodels SVM cost 10 gamma 0.01	1.78
Nmodels SVM cost 5 gamma 0.01	0.8
Quantile SVM cost 10 gamma 0.001	0.72
Nmodels SVM cost 100 gamma 0.001	0.63
Quantile SVM cost 1 gamma 0.01	0.47
Quantile SVM cost 5 gamma 0.001	0.08
Nmodels SVM cost 50 gamma 0.001	-0.05
Quantile SVM cost 1 gamma 0.001	-0.05
Iterated SVM cost 50 gamma 0.01	-0.07
Iterated SVM cost 5 gamma 0.05	-0.17
Iterated SVM cost 100 gamma 0.01	-0.2
Iterated SVM cost 10 gamma 0.05	-0.39
Iterated SVM cost 5 gamma 0.01	-0.55
Iterated SVM cost 1 gamma 0.05	-0.57
Iterated SVM cost 50 gamma 0.05	-0.66
Iterated SVM cost 100 gamma 0.05	-0.71
Iterated SVM cost 10 gamma 0.01	-0.79
Nmodels SVM cost 1 gamma 0.01	-0.94
Iterated SVM cost 50 gamma 0.001	-0.94
Iterated QRF ntree 1500	-0.96
Iterated SVM cost 100 gamma 0.1	-0.97
Iterated QRF ntree 1000	-1
Iterated QRF ntree 500	-1
Iterated SVM cost 50 gamma 0.1	-1.03
Nmodels SVM cost 10 gamma 0.001	-1.06
Iterated SVM cost 100 gamma 0.001	-1.2
Iterated SVM cost 10 gamma 0.001	-1.32
Iterated SVM cost 1 gamma 0.1	-1.4
Iterated RF ntree 500	-1.4
Iterated RF ntree 1500	-1.42
Iterated SVM cost 10 gamma 0.1	-1.42
Iterated SVM cost 5 gamma 0.1	-1.43
Iterated RF ntree 1000	-1.46
Nmodels SVM cost 5 gamma 0.001	-1.56
Iterated SVM cost 5 gamma 0.001	-1.6
RW	-1.6
Iterated SVM cost 1 gamma 0.01	-1.83
Iterated RT se 0	-1.9
Iterated RT se 0.5	-2.02
Iterated SVM cost 1 gamma 0.001	-2.21
Nmodels SVM cost 1 gamma 0.001	-2.21

Iterated RT se 1.5	-2.32
Iterated RT se 1	-2.45

Table 2.21: All setups Utility

## Chapter 3

# Window Size 30

This chapter presents the results for the 7 artificial datasets (streams) for the window size of 30 values,  $k = 30$ .

### 3.1 Stream 1

#### 3.1.1 MAQ - Mean Absolute Quantile Deviation

Figure 3.1 shows the results using the MAQ error measure for all different setups.

Table 3.1 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Nmodels SVM cost 100 gamma 0.1	3.36	3.26	3.31
Quantile SVM cost 100 gamma 0.1	3.6	3.17	3.38
Nmodels SVM cost 50 gamma 0.1	3.56	3.42	3.49
Quantile SVM cost 50 gamma 0.1	3.76	3.33	3.54
Nmodels SVM cost 10 gamma 0.1	4.11	3.76	3.93
Nmodels SVM cost 100 gamma 0.05	4.08	3.89	3.98
Quantile SVM cost 100 gamma 0.05	4.33	3.66	4
Nmodels SVM cost 50 gamma 0.05	4.07	3.92	4
Quantile SVM cost 50 gamma 0.05	4.35	3.67	4.01
Quantile SVM cost 10 gamma 0.1	4.34	3.68	4.01
Quantile RF ntree 1500	4.06	4.17	4.11
Quantile RF ntree 500	4.06	4.17	4.12
Quantile RF ntree 1000	4.05	4.18	4.12
Nmodels SVM cost 5 gamma 0.1	4.33	4.04	4.18
Nmodels RF ntree 1000	4.02	4.35	4.19
Nmodels RF ntree 1500	4.03	4.35	4.19

Nmodels RF ntree 500	4.03	4.36	4.19
Quantile SVM cost 5 gamma 0.1	4.56	3.83	4.19
Nmodels RT se 0	4.23	4.28	4.25
Quantile SVM cost 10 gamma 0.05	4.6	3.96	4.28
Nmodels SVM cost 10 gamma 0.05	4.4	4.2	4.3
Quantile RT se 0	4.05	4.68	4.37
Quantile SVM cost 5 gamma 0.05	4.82	4.11	4.46
Nmodels SVM cost 5 gamma 0.05	4.68	4.38	4.53
Nmodels RT se 0.5	4.59	4.73	4.66
Nmodels QRF ntree 1000	4.49	5.26	4.88
Nmodels QRF ntree 1500	4.49	5.27	4.88
Nmodels QRF ntree 500	4.5	5.26	4.88
Quantile SVM cost 100 gamma 0.01	4.99	4.85	4.92
Nmodels RT se 1	4.83	5.09	4.96
Quantile RT se 0.5	4.64	5.31	4.97
Nmodels SVM cost 100 gamma 0.01	5.05	4.95	5
Quantile SVM cost 50 gamma 0.01	5.09	5.04	5.06
Nmodels SVM cost 50 gamma 0.01	5.15	5.06	5.1
Quantile SVM cost 1 gamma 0.1	5.45	4.84	5.14
Nmodels RT se 1.5	5.12	5.32	5.22
Nmodels SVM cost 1 gamma 0.1	5.45	5.18	5.32
Quantile RT se 1	5.01	5.7	5.35
Quantile QRF ntree 1000	5.09	5.62	5.36
Quantile QRF ntree 500	5.11	5.62	5.36
Quantile QRF ntree 1500	5.12	5.63	5.38
Nmodels SVM cost 10 gamma 0.01	5.42	5.41	5.41
Quantile SVM cost 1 gamma 0.05	5.6	5.27	5.44
Quantile SVM cost 10 gamma 0.01	5.41	5.51	5.46
Nmodels SVM cost 1 gamma 0.05	5.71	5.41	5.56
Quantile RT se 1.5	5.25	6.02	5.64
Nmodels SVM cost 5 gamma 0.01	5.69	5.71	5.7
Quantile SVM cost 5 gamma 0.01	5.64	5.83	5.73
Nmodels SVM cost 100 gamma 0.001	5.95	6.65	6.3
Quantile SVM cost 100 gamma 0.001	6.21	6.53	6.37
Nmodels SVM cost 50 gamma 0.001	6.06	6.87	6.46
Quantile SVM cost 50 gamma 0.001	6.36	6.61	6.49
Quantile SVM cost 1 gamma 0.01	6.67	6.92	6.8
Nmodels SVM cost 1 gamma 0.01	6.57	7.06	6.82
Nmodels SVM cost 10 gamma 0.001	6.36	7.53	6.94
Quantile SVM cost 10 gamma 0.001	6.92	6.98	6.95
Nmodels SVM cost 5 gamma 0.001	6.63	7.87	7.25

Quantile SVM cost 5 gamma 0.001	7.3	7.27	7.29
Iterated RT se 0.5	7.24	10.13	8.68
Iterated RT se 1	7.23	10.2	8.71
Iterated RT se 0	7.28	10.2	8.74
Iterated RT se 1.5	7.25	10.24	8.75
Nmodels SVM cost 1 gamma 0.001	7.93	9.62	8.78
Quantile SVM cost 1 gamma 0.001	8.96	8.72	8.84
Iterated RF ntree 500	8.16	9.97	9.06
Iterated RF ntree 1500	8.19	9.96	9.08
Iterated RF ntree 1000	8.19	9.97	9.08
Iterated QRF ntree 1000	8.79	10.31	9.55
Iterated QRF ntree 1500	8.8	10.32	9.56
Iterated QRF ntree 500	8.79	10.34	9.57
Iterated SVM cost 5 gamma 0.01	9.07	10.56	9.82
Iterated SVM cost 10 gamma 0.01	9.21	10.43	9.82
Iterated SVM cost 10 gamma 0.001	9.1	10.76	9.93
Iterated SVM cost 50 gamma 0.01	9.44	10.54	9.99
Iterated SVM cost 5 gamma 0.001	9.2	10.9	10.05
Iterated SVM cost 100 gamma 0.01	9.66	10.69	10.17
Iterated SVM cost 1 gamma 0.001	9.59	11.8	10.7
Iterated SVM cost 50 gamma 0.001	10.52	10.89	10.71
Iterated SVM cost 1 gamma 0.01	10.13	11.69	10.91
Iterated SVM cost 100 gamma 0.001	11.33	10.96	11.15
Iterated SVM cost 50 gamma 0.05	11.15	11.69	11.42
Iterated SVM cost 100 gamma 0.05	11.19	11.7	11.44
Iterated SVM cost 5 gamma 0.05	11.36	11.6	11.48
Iterated SVM cost 10 gamma 0.05	11.27	11.7	11.48
Iterated SVM cost 1 gamma 0.05	11.19	12.35	11.77
Iterated SVM cost 5 gamma 0.1	12.24	12.93	12.59
Iterated SVM cost 1 gamma 0.1	11.99	13.19	12.59
Iterated SVM cost 100 gamma 0.1	12.45	13.06	12.75
Iterated SVM cost 50 gamma 0.1	12.46	13.06	12.76
Iterated SVM cost 10 gamma 0.1	12.64	13.12	12.88
RW	35.96	24.79	30.37

Table 3.1: All setups MAQ

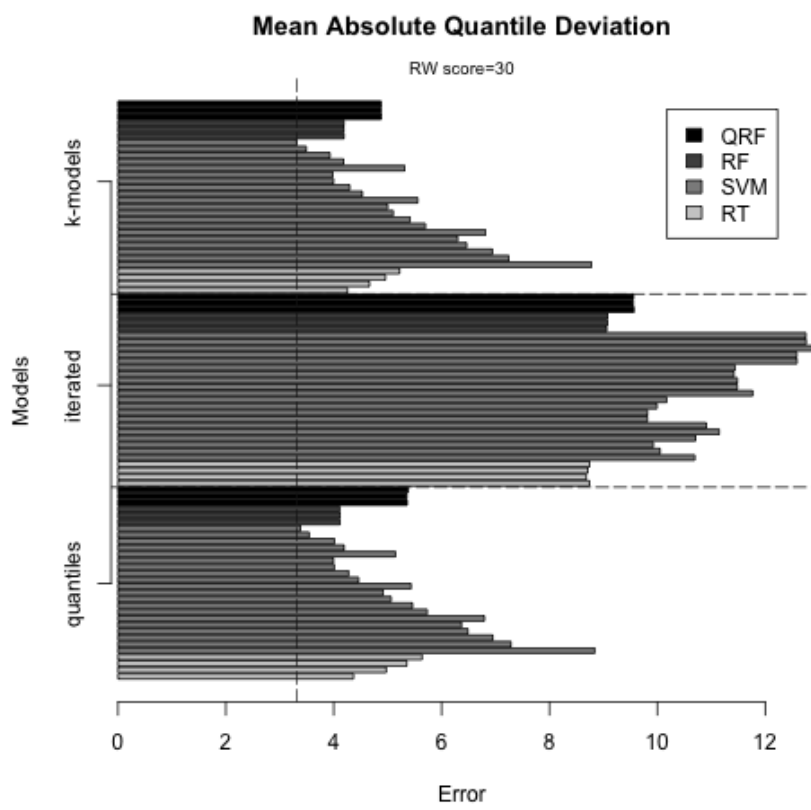


Figure 3.1: Stream 1



### 3.1.2 TQE - Total Quantile Error

Figure 3.2 shows the results using the TQE error measure for all different setups.

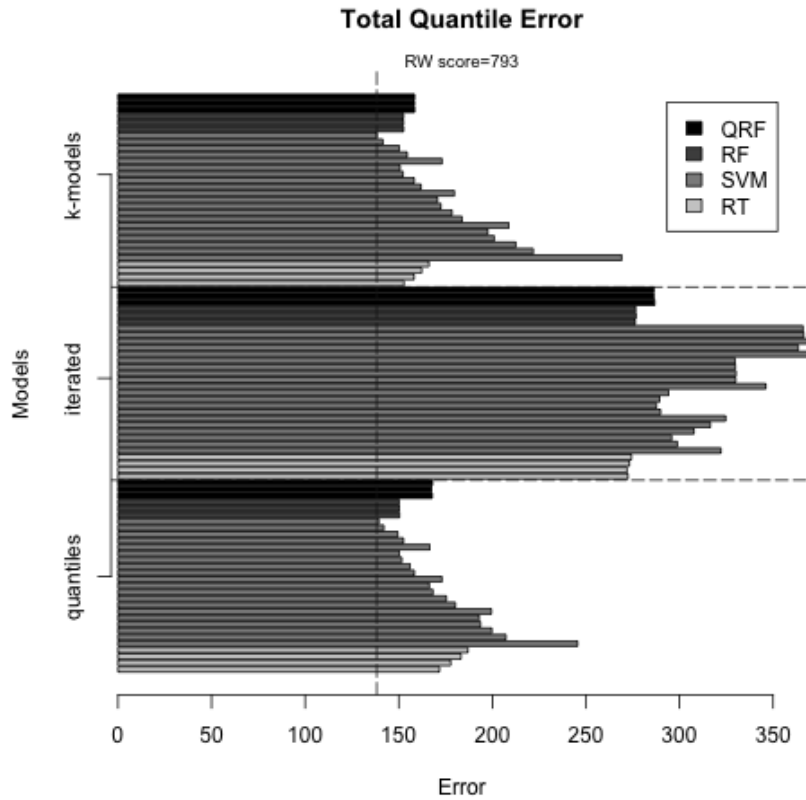


Figure 3.2: Stream 1

Table 3.2 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Nmodels SVM cost 100 gamma 0.1	69.38	68.88	138.26
Quantile SVM cost 100 gamma 0.1	70.73	68.64	139.37
Nmodels SVM cost 50 gamma 0.1	71.18	70.32	141.5
Quantile SVM cost 50 gamma 0.1	72.1	70	142.09
Quantile SVM cost 10 gamma 0.1	76.5	72.94	149.44
Quantile RF ntree 1500	73.14	77.05	150.19
Nmodels SVM cost 10 gamma 0.1	76.25	74	150.25

Quantile RF ntree 1000	73.06	77.21	150.27
Quantile SVM cost 100 gamma 0.05	77.31	72.99	150.31
Quantile RF ntree 500	73.27	77.08	150.35
Nmodels SVM cost 100 gamma 0.05	76.35	74.35	150.69
Quantile SVM cost 50 gamma 0.05	78.32	73.37	151.68
Nmodels SVM cost 50 gamma 0.05	77.13	75.14	152.27
Nmodels RF ntree 1000	73.83	78.68	152.52
Quantile SVM cost 5 gamma 0.1	78.5	74.05	152.55
Nmodels RF ntree 1500	73.86	78.69	152.55
Nmodels RF ntree 500	73.84	78.76	152.6
Nmodels RT se 0	75.64	77.14	152.78
Nmodels SVM cost 5 gamma 0.1	78.06	76.46	154.52
Quantile SVM cost 10 gamma 0.05	80.67	75.36	156.03
Nmodels RT se 0.5	77.87	80.34	158.21
Nmodels SVM cost 10 gamma 0.05	79.89	78.39	158.28
Quantile SVM cost 5 gamma 0.05	81.51	76.85	158.35
Nmodels QRF ntree 1000	75	83.42	158.42
Nmodels QRF ntree 1500	75.02	83.43	158.46
Nmodels QRF ntree 500	75.06	83.42	158.48
Nmodels SVM cost 5 gamma 0.05	81.7	80.19	161.89
Nmodels RT se 1	79.67	82.62	162.3
Nmodels RT se 1.5	81.57	84.56	166.14
Quantile SVM cost 100 gamma 0.01	82.28	84.02	166.3
Quantile SVM cost 1 gamma 0.1	83.82	82.79	166.61
Quantile QRF ntree 1000	81.06	86.43	167.49
Quantile QRF ntree 500	81.43	86.45	167.88
Quantile QRF ntree 1500	81.43	86.57	168
Quantile SVM cost 50 gamma 0.01	82.7	85.55	168.25
Nmodels SVM cost 100 gamma 0.01	83.92	86.79	170.71
Quantile RT se 0	79.8	91.98	171.78
Nmodels SVM cost 50 gamma 0.01	84.41	88.09	172.5
Quantile SVM cost 1 gamma 0.05	85.99	87.09	173.08
Nmodels SVM cost 1 gamma 0.1	85.59	87.51	173.11
Quantile SVM cost 10 gamma 0.01	84.98	90.46	175.44
Quantile RT se 0.5	81.32	96.4	177.72
Nmodels SVM cost 10 gamma 0.01	86.09	92.35	178.44
Nmodels SVM cost 1 gamma 0.05	88.75	90.96	179.71
Quantile SVM cost 5 gamma 0.01	85.82	94.43	180.25
Quantile RT se 1	83.15	100.09	183.24
Nmodels SVM cost 5 gamma 0.01	88.19	95.7	183.88
Quantile RT se 1.5	84.49	102.44	186.93

Quantile SVM cost 100 gamma 0.001	91.73	101.24	192.96
Quantile SVM cost 50 gamma 0.001	92.32	101.35	193.67
Nmodels SVM cost 100 gamma 0.001	91.37	106.19	197.56
Quantile SVM cost 1 gamma 0.01	92.45	107.05	199.5
Quantile SVM cost 10 gamma 0.001	96.86	102.88	199.74
Nmodels SVM cost 50 gamma 0.001	92.06	108.9	200.95
Quantile SVM cost 5 gamma 0.001	100.8	106.47	207.27
Nmodels SVM cost 1 gamma 0.01	95.48	113.32	208.8
Nmodels SVM cost 10 gamma 0.001	96.55	115.94	212.5
Nmodels SVM cost 5 gamma 0.001	101.28	120.54	221.83
Quantile SVM cost 1 gamma 0.001	117.84	127.69	245.53
Nmodels SVM cost 1 gamma 0.001	115.91	153.18	269.08
Iterated RT se 0.5	110.69	161.23	271.91
Iterated RT se 0	112.08	160.33	272.41
Iterated RT se 1	110.59	162.58	273.17
Iterated RT se 1.5	110.81	163.52	274.33
Iterated RF ntree 500	117.45	158.87	276.32
Iterated RF ntree 1500	117.98	158.56	276.53
Iterated RF ntree 1000	118.04	158.72	276.76
Iterated QRF ntree 1000	121.34	164.93	286.27
Iterated QRF ntree 1500	121.21	165.11	286.32
Iterated QRF ntree 500	121.55	165.16	286.71
Iterated SVM cost 10 gamma 0.01	117.19	170.46	287.64
Iterated SVM cost 50 gamma 0.01	119.63	169.82	289.45
Iterated SVM cost 5 gamma 0.01	116.47	173.39	289.86
Iterated SVM cost 100 gamma 0.01	122.52	171.71	294.23
Iterated SVM cost 10 gamma 0.001	116.37	179.41	295.78
Iterated SVM cost 5 gamma 0.001	118.67	180.12	298.79
Iterated SVM cost 50 gamma 0.001	125.91	181.8	307.71
Iterated SVM cost 100 gamma 0.001	133.12	183.34	316.46
Iterated SVM cost 1 gamma 0.001	130.69	191.44	322.13
Iterated SVM cost 1 gamma 0.01	126.04	198.58	324.63
Iterated SVM cost 100 gamma 0.05	139.41	190.29	329.71
Iterated SVM cost 50 gamma 0.05	140.2	189.58	329.78
Iterated SVM cost 5 gamma 0.05	136.49	193.51	330
Iterated SVM cost 10 gamma 0.05	137.48	192.68	330.16
Iterated SVM cost 1 gamma 0.05	138.36	207.73	346.09
Iterated SVM cost 5 gamma 0.1	143.31	220.09	363.4
Iterated SVM cost 100 gamma 0.1	145.16	220.78	365.94
Iterated SVM cost 50 gamma 0.1	145.35	220.96	366.31
Iterated SVM cost 1 gamma 0.1	143.3	227.04	370.34

Iterated SVM cost 10 gamma 0.1	148.52	222.61	371.13
RW	319.63	473.52	793.15

Table 3.2: All setups TQE

### 3.1.3 Utility

Figure 3.3 shows the results using the Utility error measure (larger is better) for all different setups.

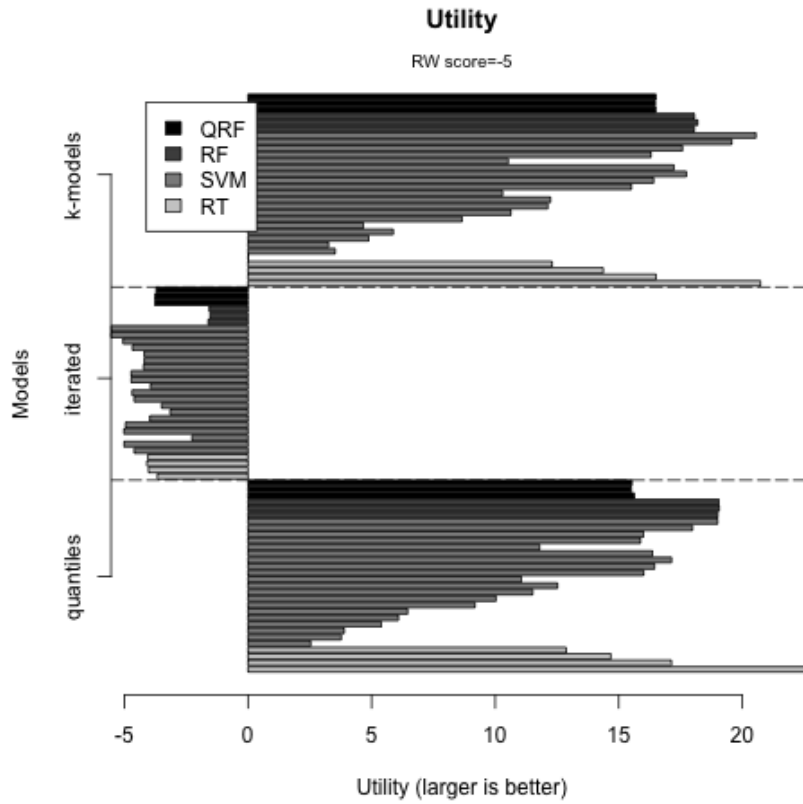


Figure 3.3: Stream 1

Table 3.3 shows all setups order by the Utility.

	utility
Quantile RT se 0	22.84
Nmodels RT se 0	20.73
Nmodels SVM cost 100 gamma 0.1	20.55
Nmodels SVM cost 50 gamma 0.1	19.57
Quantile RF ntree 1000	19.06
Quantile RF ntree 1500	19.05
Quantile RF ntree 500	19

Quantile SVM cost 100 gamma 0.1	19
Nmodels RF ntree 1000	18.19
Nmodels RF ntree 1500	18.06
Nmodels RF ntree 500	18.06
Quantile SVM cost 50 gamma 0.1	17.98
Nmodels SVM cost 50 gamma 0.05	17.73
Nmodels SVM cost 10 gamma 0.1	17.58
Nmodels SVM cost 100 gamma 0.05	17.23
Quantile SVM cost 50 gamma 0.05	17.13
Quantile RT se 0.5	17.13
Nmodels RT se 0.5	16.5
Nmodels QRF ntree 1500	16.5
Nmodels QRF ntree 500	16.49
Nmodels QRF ntree 1000	16.48
Quantile SVM cost 10 gamma 0.05	16.44
Nmodels SVM cost 10 gamma 0.05	16.41
Quantile SVM cost 100 gamma 0.05	16.37
Nmodels SVM cost 5 gamma 0.1	16.3
Quantile SVM cost 5 gamma 0.05	16.01
Quantile SVM cost 10 gamma 0.1	16.01
Quantile SVM cost 5 gamma 0.1	15.88
Quantile QRF ntree 500	15.63
Quantile QRF ntree 1500	15.53
Nmodels SVM cost 5 gamma 0.05	15.51
Quantile QRF ntree 1000	15.51
Quantile RT se 1	14.68
Nmodels RT se 1	14.37
Quantile RT se 1.5	12.87
Quantile SVM cost 100 gamma 0.01	12.52
Nmodels RT se 1.5	12.3
Nmodels SVM cost 100 gamma 0.01	12.24
Nmodels SVM cost 50 gamma 0.01	12.13
Quantile SVM cost 1 gamma 0.1	11.8
Quantile SVM cost 50 gamma 0.01	11.52
Quantile SVM cost 1 gamma 0.05	11.06
Nmodels SVM cost 10 gamma 0.01	10.63
Nmodels SVM cost 1 gamma 0.1	10.53
Nmodels SVM cost 1 gamma 0.05	10.3
Quantile SVM cost 10 gamma 0.01	10.03
Quantile SVM cost 5 gamma 0.01	9.19
Nmodels SVM cost 5 gamma 0.01	8.66

Quantile SVM cost 1 gamma 0.01	6.46
Quantile SVM cost 100 gamma 0.001	6.09
Nmodels SVM cost 100 gamma 0.001	5.88
Quantile SVM cost 50 gamma 0.001	5.39
Nmodels SVM cost 50 gamma 0.001	4.88
Nmodels SVM cost 1 gamma 0.01	4.67
Quantile SVM cost 10 gamma 0.001	3.9
Quantile SVM cost 5 gamma 0.001	3.77
Nmodels SVM cost 5 gamma 0.001	3.53
Nmodels SVM cost 10 gamma 0.001	3.26
Quantile SVM cost 1 gamma 0.001	2.54
Nmodels SVM cost 1 gamma 0.001	0.02
Iterated RF ntree 1000	-1.53
Iterated RF ntree 1500	-1.57
Iterated RF ntree 500	-1.61
Iterated SVM cost 10 gamma 0.001	-2.26
Iterated SVM cost 5 gamma 0.01	-3.15
Iterated SVM cost 10 gamma 0.01	-3.5
Iterated RT se 0	-3.66
Iterated QRF ntree 1500	-3.71
Iterated QRF ntree 1000	-3.76
Iterated QRF ntree 500	-3.76
Iterated SVM cost 1 gamma 0.05	-3.95
Iterated SVM cost 1 gamma 0.01	-3.97
Iterated RT se 0.5	-4.02
Iterated RT se 1.5	-4.05
Iterated RT se 1	-4.09
Iterated SVM cost 100 gamma 0.05	-4.19
Iterated SVM cost 1 gamma 0.1	-4.2
Iterated SVM cost 50 gamma 0.05	-4.23
Iterated SVM cost 1 gamma 0.001	-4.6
Iterated SVM cost 50 gamma 0.01	-4.6
Iterated SVM cost 5 gamma 0.1	-4.68
Iterated SVM cost 100 gamma 0.01	-4.69
Iterated SVM cost 5 gamma 0.05	-4.72
Iterated SVM cost 10 gamma 0.05	-4.72
Iterated SVM cost 100 gamma 0.001	-4.95
Iterated SVM cost 5 gamma 0.001	-5.01
Iterated SVM cost 50 gamma 0.001	-5.02
Iterated SVM cost 10 gamma 0.1	-5.06
RW	-5.45

Iterated SVM cost 100 gamma 0.1	-5.53
Iterated SVM cost 50 gamma 0.1	-5.54

Table 3.3: All setups Utility



## 3.2 Stream 2

### 3.2.1 MAQ - Mean Absolute Quantile Deviation

Figure 3.4 shows the results using the MAQ error measure for all different setups.

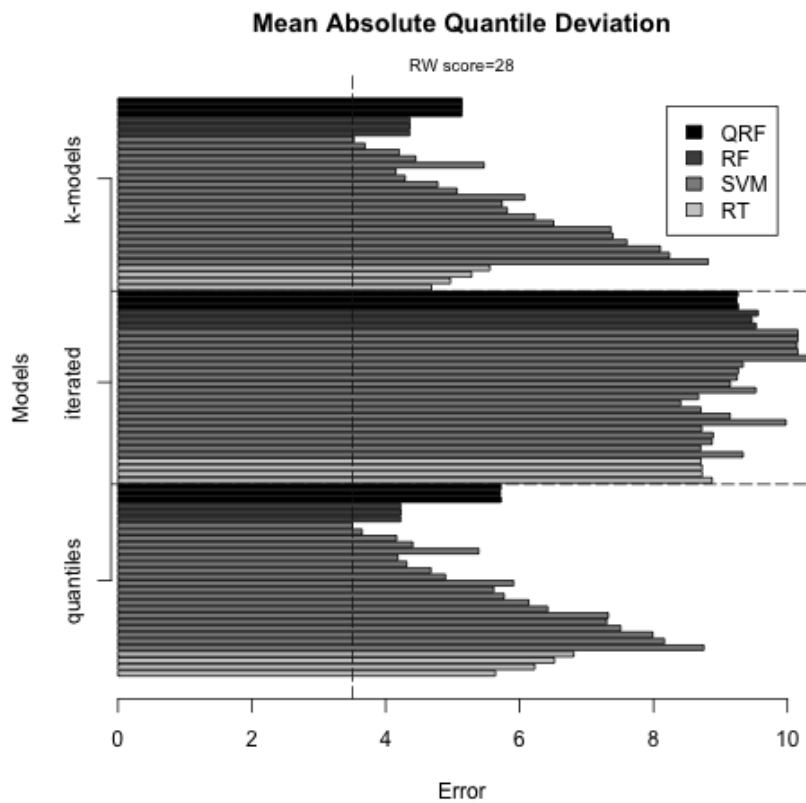


Figure 3.4: Stream 2

Table 3.4 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile SVM cost 100 gamma 0.1	3.61	3.39	3.5
Nmodels SVM cost 100 gamma 0.1	3.71	3.34	3.52
Quantile SVM cost 50 gamma 0.1	3.76	3.54	3.65
Nmodels SVM cost 50 gamma 0.1	3.89	3.5	3.69
Nmodels SVM cost 100 gamma 0.05	4.4	3.9	4.15

Quantile SVM cost 10 gamma 0.1	4.27	4.05	4.16
Quantile SVM cost 100 gamma 0.05	4.31	4.05	4.18
Nmodels SVM cost 10 gamma 0.1	4.39	4.02	4.2
Quantile RF ntree 500	4.19	4.25	4.22
Quantile RF ntree 1500	4.19	4.26	4.22
Quantile RF ntree 1000	4.2	4.26	4.23
Nmodels SVM cost 50 gamma 0.05	4.52	4.06	4.29
Quantile SVM cost 50 gamma 0.05	4.38	4.24	4.31
Nmodels RF ntree 500	4.62	4.1	4.36
Nmodels RF ntree 1500	4.63	4.09	4.36
Nmodels RF ntree 1000	4.62	4.1	4.36
Quantile SVM cost 5 gamma 0.1	4.46	4.35	4.4
Nmodels SVM cost 5 gamma 0.1	4.61	4.28	4.45
Quantile SVM cost 10 gamma 0.05	4.63	4.72	4.67
Nmodels RT se 0	4.34	5.03	4.68
Nmodels SVM cost 10 gamma 0.05	4.88	4.68	4.78
Quantile SVM cost 5 gamma 0.05	4.81	4.98	4.89
Nmodels RT se 0.5	4.64	5.3	4.97
Nmodels SVM cost 5 gamma 0.05	5.12	5.01	5.06
Nmodels QRF ntree 500	4.72	5.55	5.14
Nmodels QRF ntree 1500	4.72	5.55	5.14
Nmodels QRF ntree 1000	4.73	5.56	5.14
Nmodels RT se 1	4.93	5.63	5.28
Quantile SVM cost 1 gamma 0.1	5.29	5.49	5.39
Nmodels SVM cost 1 gamma 0.1	5.62	5.31	5.47
Nmodels RT se 1.5	5.27	5.84	5.56
Quantile SVM cost 100 gamma 0.01	5.51	5.72	5.61
Quantile RT se 0	5.22	6.06	5.64
Quantile QRF ntree 1000	5.16	6.26	5.71
Quantile QRF ntree 1500	5.17	6.27	5.72
Quantile QRF ntree 500	5.19	6.26	5.72
Nmodels SVM cost 100 gamma 0.01	5.8	5.68	5.74
Quantile SVM cost 50 gamma 0.01	5.61	5.93	5.77
Nmodels SVM cost 50 gamma 0.01	5.9	5.73	5.81
Quantile SVM cost 1 gamma 0.05	5.8	6.02	5.91
Nmodels SVM cost 1 gamma 0.05	6.19	5.96	6.07
Quantile SVM cost 10 gamma 0.01	5.96	6.31	6.14
Quantile RT se 0.5	5.86	6.59	6.23
Nmodels SVM cost 10 gamma 0.01	6.32	6.14	6.23
Quantile SVM cost 5 gamma 0.01	6.29	6.55	6.42
Nmodels SVM cost 5 gamma 0.01	6.64	6.38	6.51

Quantile RT se 1	6.17	6.87	6.52
Quantile RT se 1.5	6.49	7.12	6.81
Quantile SVM cost 100 gamma 0.001	7.41	7.19	7.3
Quantile SVM cost 1 gamma 0.01	7.44	7.21	7.32
Nmodels SVM cost 1 gamma 0.01	7.71	7.01	7.36
Nmodels SVM cost 100 gamma 0.001	7.41	7.38	7.4
Quantile SVM cost 50 gamma 0.001	7.68	7.34	7.51
Nmodels SVM cost 50 gamma 0.001	7.74	7.47	7.6
Quantile SVM cost 10 gamma 0.001	8.22	7.75	7.99
Nmodels SVM cost 10 gamma 0.001	8.55	7.65	8.1
Quantile SVM cost 5 gamma 0.001	8.4	7.92	8.16
Nmodels SVM cost 5 gamma 0.001	8.86	7.61	8.24
Iterated SVM cost 50 gamma 0.01	8.76	8.05	8.41
Iterated SVM cost 100 gamma 0.01	9.07	8.27	8.67
Iterated SVM cost 5 gamma 0.001	9.16	8.25	8.7
Iterated RT se 1.5	8.98	8.43	8.71
Iterated SVM cost 10 gamma 0.01	9.08	8.34	8.71
Iterated SVM cost 100 gamma 0.001	9.02	8.43	8.72
Iterated RT se 1	9.01	8.44	8.72
Iterated RT se 0.5	9.02	8.44	8.73
Quantile SVM cost 1 gamma 0.001	8.82	8.68	8.75
Nmodels SVM cost 1 gamma 0.001	9.57	8.06	8.81
Iterated SVM cost 10 gamma 0.001	9.2	8.55	8.87
Iterated RT se 0	9.13	8.62	8.88
Iterated SVM cost 50 gamma 0.001	9.18	8.61	8.89
Iterated SVM cost 5 gamma 0.01	9.6	8.69	9.14
Iterated SVM cost 5 gamma 0.05	9.8	8.5	9.15
Iterated QRF ntree 1000	9.7	8.79	9.24
Iterated SVM cost 10 gamma 0.05	9.91	8.59	9.25
Iterated QRF ntree 1500	9.71	8.82	9.26
Iterated QRF ntree 500	9.71	8.82	9.27
Iterated SVM cost 50 gamma 0.05	9.89	8.65	9.27
Iterated SVM cost 1 gamma 0.001	10.06	8.61	9.34
Iterated SVM cost 100 gamma 0.05	9.88	8.79	9.34
Iterated RF ntree 1000	9.51	9.43	9.47
Iterated SVM cost 1 gamma 0.05	10.35	8.71	9.53
Iterated RF ntree 500	9.58	9.48	9.53
Iterated RF ntree 1500	9.61	9.51	9.56
Iterated SVM cost 1 gamma 0.01	10.65	9.31	9.98
Iterated SVM cost 10 gamma 0.1	10.76	9.52	10.14
Iterated SVM cost 100 gamma 0.1	10.71	9.6	10.16

Iterated SVM cost 50 gamma 0.1	10.71	9.6	10.16
Iterated SVM cost 5 gamma 0.1	10.76	9.55	10.16
Iterated SVM cost 1 gamma 0.1	11.32	9.44	10.38
RW	20.3	34.87	27.58

Table 3.4: All setups MAQ

### 3.2.2 TQE - Total Quantile Error

Figure 3.5 shows the results using the TQE error measure for all different setups.

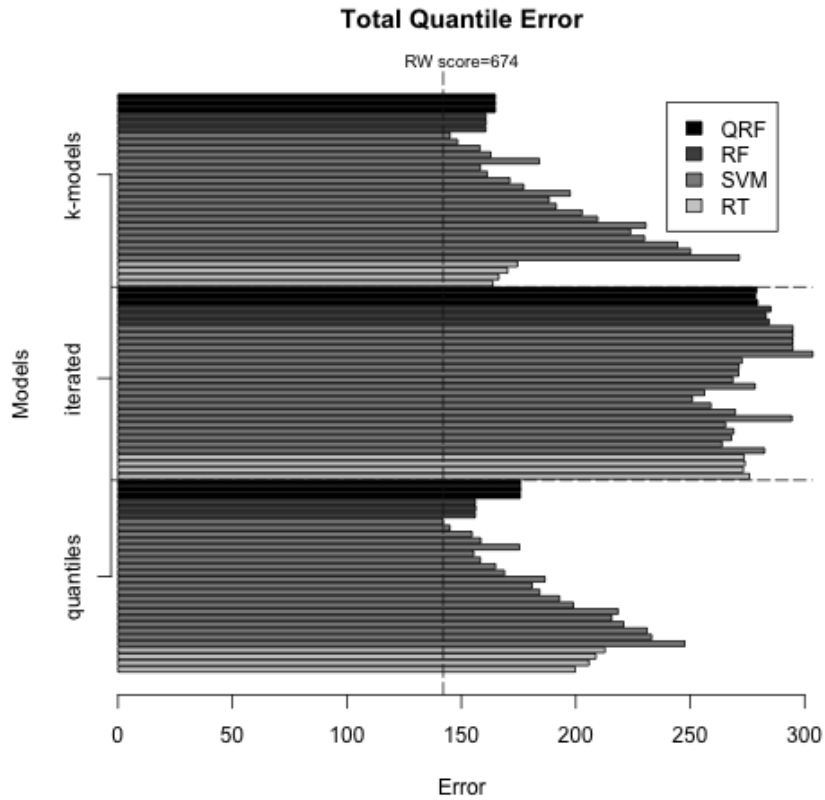


Figure 3.5: Stream 2

Table 3.5 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile SVM cost 100 gamma 0.1	72.94	69.11	142.05
Quantile SVM cost 50 gamma 0.1	74.81	70.19	145
Nmodels SVM cost 100 gamma 0.1	75.02	70.03	145.05
Nmodels SVM cost 50 gamma 0.1	76.77	71.61	148.38
Quantile SVM cost 10 gamma 0.1	80.07	74.61	154.69
Quantile SVM cost 100 gamma 0.05	80.75	74.68	155.42
Quantile RF ntree 500	78.28	77.83	156.1

Quantile RF ntree 1500	78.23	77.89	156.12
Quantile RF ntree 1000	78.3	77.98	156.28
Nmodels SVM cost 10 gamma 0.1	82.46	75.63	158.09
Nmodels SVM cost 100 gamma 0.05	83.17	75.13	158.3
Quantile SVM cost 50 gamma 0.05	81.83	76.48	158.32
Quantile SVM cost 5 gamma 0.1	81.88	76.67	158.55
Nmodels RF ntree 500	83.88	76.8	160.68
Nmodels RF ntree 1500	83.96	76.76	160.73
Nmodels RF ntree 1000	83.92	76.85	160.78
Nmodels SVM cost 50 gamma 0.05	85.04	76.35	161.39
Nmodels SVM cost 5 gamma 0.1	85.49	77.46	162.96
Nmodels RT se 0	80.42	83.34	163.76
Nmodels QRF ntree 1500	80.23	84.59	164.83
Nmodels QRF ntree 500	80.26	84.58	164.85
Nmodels QRF ntree 1000	80.28	84.59	164.87
Quantile SVM cost 10 gamma 0.05	85.61	79.32	164.93
Nmodels RT se 0.5	81.58	84.81	166.38
Quantile SVM cost 5 gamma 0.05	87.94	80.9	168.84
Nmodels RT se 1	83.33	86.89	170.21
Nmodels SVM cost 10 gamma 0.05	90.87	80.31	171.18
Nmodels RT se 1.5	86.17	88.37	174.54
Quantile SVM cost 1 gamma 0.1	91.33	84.05	175.38
Quantile QRF ntree 500	84.27	91.52	175.78
Quantile QRF ntree 1500	84.23	91.63	175.86
Quantile QRF ntree 1000	84.14	91.76	175.9
Nmodels SVM cost 5 gamma 0.05	94.55	82.7	177.25
Quantile SVM cost 100 gamma 0.01	95.33	85.56	180.9
Nmodels SVM cost 1 gamma 0.1	98.84	85.22	184.06
Quantile SVM cost 50 gamma 0.01	96.66	87.53	184.2
Quantile SVM cost 1 gamma 0.05	97.63	88.9	186.53
Nmodels SVM cost 100 gamma 0.01	100.85	87.47	188.32
Nmodels SVM cost 50 gamma 0.01	103.03	88.4	191.44
Quantile SVM cost 10 gamma 0.01	101.23	91.67	192.9
Nmodels SVM cost 1 gamma 0.05	106.51	91.02	197.53
Quantile SVM cost 5 gamma 0.01	104.77	94.19	198.96
Quantile RT se 0	97.41	102.4	199.81
Nmodels SVM cost 10 gamma 0.01	109.4	93.34	202.74
Quantile RT se 0.5	101.29	104.48	205.77
Quantile RT se 1	103.43	105.34	208.78
Nmodels SVM cost 5 gamma 0.01	113.19	96.36	209.55
Quantile RT se 1.5	105.79	106.98	212.77

Quantile SVM cost 100 gamma 0.001	116.3	99.39	215.69
Quantile SVM cost 1 gamma 0.01	116.46	101.99	218.45
Quantile SVM cost 50 gamma 0.001	119.14	101.8	220.94
Nmodels SVM cost 100 gamma 0.001	117.99	105.9	223.89
Nmodels SVM cost 50 gamma 0.001	122.05	107.97	230.02
Nmodels SVM cost 1 gamma 0.01	125.79	104.79	230.57
Quantile SVM cost 10 gamma 0.001	123.71	107.51	231.22
Quantile SVM cost 5 gamma 0.001	124.42	108.73	233.15
Nmodels SVM cost 10 gamma 0.001	132.48	112.03	244.51
Quantile SVM cost 1 gamma 0.001	133.73	113.94	247.68
Nmodels SVM cost 5 gamma 0.001	138.15	112.01	250.16
Iterated SVM cost 50 gamma 0.01	136.19	114.74	250.93
Iterated SVM cost 100 gamma 0.01	139.14	117.13	256.27
Iterated SVM cost 10 gamma 0.01	142.4	116.66	259.06
Iterated SVM cost 5 gamma 0.001	145.14	118.76	263.9
Iterated SVM cost 100 gamma 0.001	142.03	123.4	265.42
Iterated SVM cost 10 gamma 0.001	145.26	122.71	267.97
Iterated SVM cost 5 gamma 0.05	153.86	114.75	268.62
Iterated SVM cost 50 gamma 0.001	144.05	124.9	268.95
Iterated SVM cost 5 gamma 0.01	148.48	121.19	269.67
Iterated SVM cost 10 gamma 0.05	155.92	115.27	271.19
Iterated SVM cost 50 gamma 0.05	155.7	115.55	271.25
Nmodels SVM cost 1 gamma 0.001	156.02	115.4	271.42
Iterated SVM cost 100 gamma 0.05	156.07	116.54	272.62
Iterated RT se 0.5	137.7	135.44	273.15
Iterated RT se 1.5	137.58	135.87	273.46
Iterated RT se 1	138.09	135.84	273.93
Iterated RT se 0	138.54	137.37	275.91
Iterated SVM cost 1 gamma 0.05	163.25	115.09	278.34
Iterated QRF ntree 1000	139.42	139.19	278.61
Iterated QRF ntree 1500	139.45	139.65	279.09
Iterated QRF ntree 500	139.54	139.87	279.42
Iterated SVM cost 1 gamma 0.001	160.75	121.75	282.5
Iterated RF ntree 1000	138.58	144.56	283.14
Iterated RF ntree 500	139.75	144.69	284.44
Iterated RF ntree 1500	139.95	145.25	285.2
Iterated SVM cost 1 gamma 0.01	165.17	129.24	294.42
Iterated SVM cost 10 gamma 0.1	173.4	121.37	294.77
Iterated SVM cost 5 gamma 0.1	173.79	121.01	294.8
Iterated SVM cost 100 gamma 0.1	172.66	122.2	294.85
Iterated SVM cost 50 gamma 0.1	172.66	122.2	294.86

Iterated SVM cost 1 gamma 0.1	182.38	121.13	303.51
RW	368.72	305.62	674.34

Table 3.5: All setups TQE



### 3.2.3 Utility

Figure 3.6 shows the results using the Utility error measure (larger is better) for all different setups.

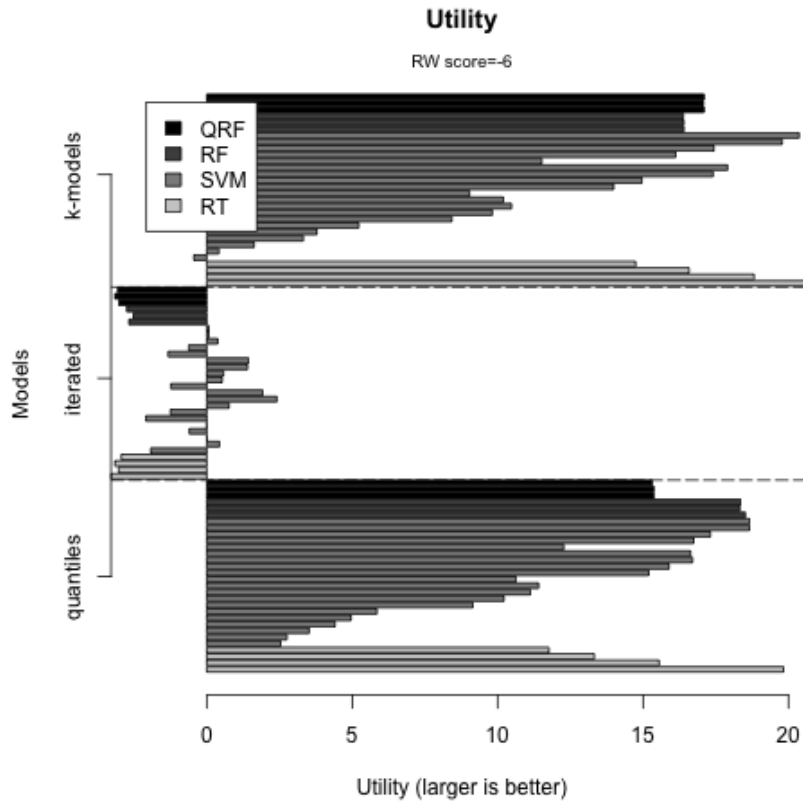


Figure 3.6: Stream 2

Table 3.6 shows all setups order by the Utility.

	utility
Nmodels RT se 0	20.83
Nmodels SVM cost 100 gamma 0.1	20.37
Quantile RT se 0	19.83
Nmodels SVM cost 50 gamma 0.1	19.78
Nmodels RT se 0.5	18.82
Quantile SVM cost 100 gamma 0.1	18.66
Quantile SVM cost 50 gamma 0.1	18.66

Quantile RF ntree 500	18.52
Quantile RF ntree 1500	18.35
Quantile RF ntree 1000	18.33
Nmodels SVM cost 100 gamma 0.05	17.91
Nmodels SVM cost 10 gamma 0.1	17.44
Nmodels SVM cost 50 gamma 0.05	17.41
Quantile SVM cost 10 gamma 0.1	17.32
Nmodels QRF ntree 1500	17.1
Nmodels QRF ntree 500	17.1
Nmodels QRF ntree 1000	17.08
Quantile SVM cost 5 gamma 0.1	16.75
Quantile SVM cost 50 gamma 0.05	16.7
Quantile SVM cost 100 gamma 0.05	16.63
Nmodels RT se 1	16.58
Nmodels RF ntree 500	16.41
Nmodels RF ntree 1000	16.4
Nmodels RF ntree 1500	16.39
Nmodels SVM cost 5 gamma 0.1	16.12
Quantile SVM cost 10 gamma 0.05	15.89
Quantile RT se 0.5	15.55
Quantile QRF ntree 1000	15.37
Quantile QRF ntree 500	15.37
Quantile QRF ntree 1500	15.31
Quantile SVM cost 5 gamma 0.05	15.2
Nmodels SVM cost 10 gamma 0.05	14.96
Nmodels RT se 1.5	14.75
Nmodels SVM cost 5 gamma 0.05	13.99
Quantile RT se 1	13.32
Quantile SVM cost 1 gamma 0.1	12.28
Quantile RT se 1.5	11.77
Nmodels SVM cost 1 gamma 0.1	11.52
Quantile SVM cost 100 gamma 0.01	11.41
Quantile SVM cost 50 gamma 0.01	11.12
Quantile SVM cost 1 gamma 0.05	10.64
Nmodels SVM cost 50 gamma 0.01	10.48
Quantile SVM cost 10 gamma 0.01	10.22
Nmodels SVM cost 100 gamma 0.01	10.19
Nmodels SVM cost 10 gamma 0.01	9.82
Quantile SVM cost 5 gamma 0.01	9.15
Nmodels SVM cost 1 gamma 0.05	9.03
Nmodels SVM cost 5 gamma 0.01	8.43

Quantile SVM cost 1 gamma 0.01	5.85
Nmodels SVM cost 1 gamma 0.01	5.23
Quantile SVM cost 100 gamma 0.001	4.96
Quantile SVM cost 50 gamma 0.001	4.41
Nmodels SVM cost 100 gamma 0.001	3.79
Quantile SVM cost 10 gamma 0.001	3.52
Nmodels SVM cost 50 gamma 0.001	3.32
Quantile SVM cost 5 gamma 0.001	2.76
Quantile SVM cost 1 gamma 0.001	2.54
Iterated SVM cost 50 gamma 0.01	2.41
Iterated SVM cost 100 gamma 0.01	1.92
Nmodels SVM cost 10 gamma 0.001	1.63
Iterated SVM cost 100 gamma 0.05	1.44
Iterated SVM cost 50 gamma 0.05	1.4
Iterated SVM cost 10 gamma 0.01	0.77
Iterated SVM cost 10 gamma 0.05	0.58
Iterated SVM cost 5 gamma 0.05	0.53
Iterated SVM cost 5 gamma 0.001	0.43
Nmodels SVM cost 5 gamma 0.001	0.42
Iterated SVM cost 10 gamma 0.1	0.38
Iterated SVM cost 50 gamma 0.1	0.07
Iterated SVM cost 100 gamma 0.1	0.07
Iterated SVM cost 10 gamma 0.001	0.01
Iterated SVM cost 100 gamma 0.001	-0.01
Nmodels SVM cost 1 gamma 0.001	-0.44
Iterated SVM cost 50 gamma 0.001	-0.6
Iterated SVM cost 5 gamma 0.1	-0.62
Iterated SVM cost 1 gamma 0.05	-1.23
Iterated SVM cost 5 gamma 0.01	-1.25
Iterated SVM cost 1 gamma 0.1	-1.33
Iterated SVM cost 1 gamma 0.001	-1.93
Iterated SVM cost 1 gamma 0.01	-2.09
Iterated RF ntree 1000	-2.53
Iterated RF ntree 500	-2.68
Iterated RF ntree 1500	-2.75
Iterated RT se 1.5	-2.94
Iterated QRF ntree 500	-3.02
Iterated RT se 0.5	-3.03
Iterated QRF ntree 1500	-3.06
Iterated RT se 1	-3.16
Iterated QRF ntree 1000	-3.16

Iterated RT se 0	-3.29
RW	-5.97

Table 3.6: All setups Utility

### 3.3 Stream 3

#### 3.3.1 MAQ - Mean Absolute Quantile Deviation

Figure 3.7 shows the results using the MAQ error measure for all different setups.

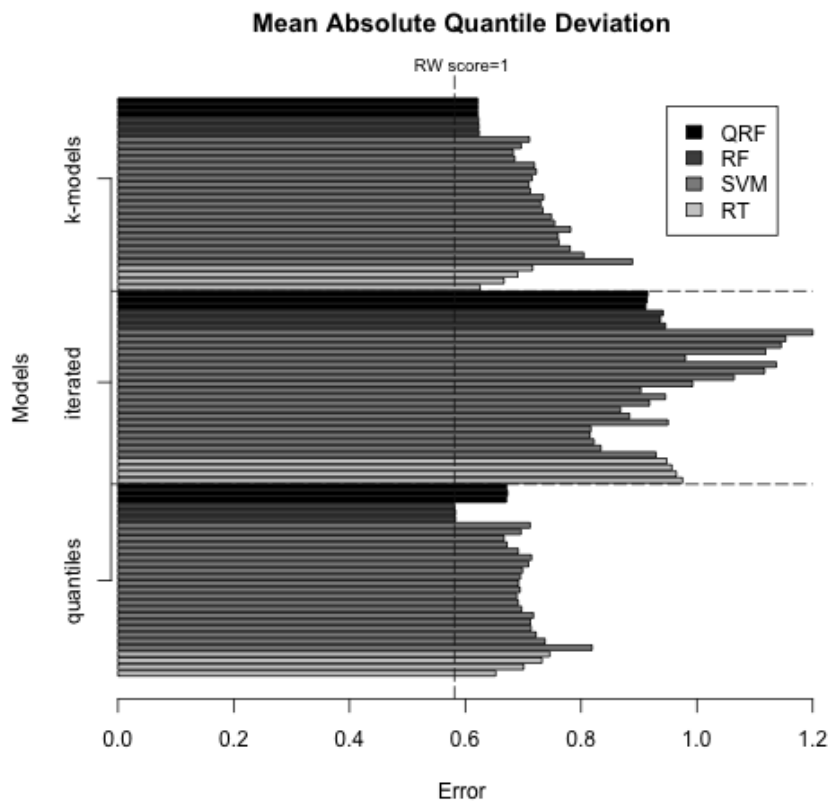


Figure 3.7: Stream 3

Table 3.7 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile RF ntree 1500	0.55	0.61	0.58
Quantile RF ntree 500	0.55	0.62	0.58
Quantile RF ntree 1000	0.55	0.61	0.58
Nmodels QRF ntree 500	0.57	0.67	0.62
Nmodels QRF ntree 1500	0.57	0.67	0.62

Nmodels QRF ntree 1000	0.57	0.67	0.62
Nmodels RF ntree 1500	0.63	0.62	0.62
Nmodels RF ntree 1000	0.63	0.62	0.62
Nmodels RF ntree 500	0.63	0.62	0.62
Nmodels RT se 0	0.59	0.66	0.63
Quantile RT se 0	0.61	0.7	0.65
Nmodels RT se 0.5	0.64	0.7	0.67
Quantile SVM cost 10 gamma 0.1	0.63	0.7	0.67
Quantile QRF ntree 500	0.63	0.71	0.67
Quantile QRF ntree 1500	0.63	0.71	0.67
Quantile SVM cost 5 gamma 0.1	0.63	0.72	0.67
Quantile QRF ntree 1000	0.63	0.71	0.67
Nmodels SVM cost 10 gamma 0.1	0.67	0.69	0.68
Nmodels SVM cost 5 gamma 0.1	0.68	0.69	0.69
Quantile SVM cost 50 gamma 0.01	0.64	0.74	0.69
Nmodels RT se 1	0.65	0.73	0.69
Quantile SVM cost 10 gamma 0.01	0.64	0.75	0.69
Quantile SVM cost 1 gamma 0.1	0.63	0.75	0.69
Quantile SVM cost 1 gamma 0.05	0.63	0.75	0.69
Quantile SVM cost 100 gamma 0.01	0.64	0.75	0.69
Quantile SVM cost 5 gamma 0.05	0.64	0.75	0.7
Quantile SVM cost 50 gamma 0.1	0.67	0.72	0.7
Nmodels SVM cost 50 gamma 0.1	0.68	0.72	0.7
Quantile SVM cost 5 gamma 0.01	0.64	0.76	0.7
Quantile SVM cost 10 gamma 0.05	0.65	0.75	0.7
Quantile RT se 0.5	0.65	0.76	0.7
Quantile SVM cost 50 gamma 0.05	0.67	0.75	0.71
Nmodels SVM cost 10 gamma 0.05	0.69	0.73	0.71
Nmodels SVM cost 100 gamma 0.1	0.69	0.73	0.71
Quantile SVM cost 100 gamma 0.1	0.69	0.73	0.71
Quantile SVM cost 100 gamma 0.001	0.65	0.77	0.71
Nmodels SVM cost 5 gamma 0.05	0.7	0.73	0.71
Quantile SVM cost 50 gamma 0.001	0.66	0.77	0.71
Quantile SVM cost 100 gamma 0.05	0.68	0.75	0.71
Nmodels SVM cost 50 gamma 0.05	0.7	0.73	0.72
Nmodels RT se 1.5	0.67	0.76	0.72
Quantile SVM cost 1 gamma 0.01	0.66	0.77	0.72
Nmodels SVM cost 1 gamma 0.1	0.71	0.73	0.72
Quantile SVM cost 10 gamma 0.001	0.67	0.78	0.72
Nmodels SVM cost 100 gamma 0.05	0.71	0.74	0.72
Nmodels SVM cost 100 gamma 0.01	0.71	0.75	0.73

Quantile RT se 1	0.67	0.8	0.73
Nmodels SVM cost 50 gamma 0.01	0.72	0.75	0.73
Nmodels SVM cost 1 gamma 0.05	0.73	0.74	0.74
Quantile SVM cost 5 gamma 0.001	0.68	0.79	0.74
Quantile RT se 1.5	0.68	0.81	0.75
Nmodels SVM cost 10 gamma 0.01	0.75	0.75	0.75
Nmodels SVM cost 5 gamma 0.01	0.76	0.75	0.75
Nmodels SVM cost 100 gamma 0.001	0.77	0.75	0.76
Nmodels SVM cost 50 gamma 0.001	0.78	0.74	0.76
Nmodels SVM cost 10 gamma 0.001	0.82	0.74	0.78
Nmodels SVM cost 1 gamma 0.01	0.82	0.75	0.78
Nmodels SVM cost 5 gamma 0.001	0.85	0.76	0.8
Iterated SVM cost 50 gamma 0.001	0.81	0.82	0.82
Iterated SVM cost 100 gamma 0.001	0.81	0.82	0.82
Quantile SVM cost 1 gamma 0.001	0.78	0.86	0.82
Iterated SVM cost 10 gamma 0.001	0.85	0.79	0.82
Iterated SVM cost 5 gamma 0.001	0.86	0.81	0.83
Iterated SVM cost 10 gamma 0.01	0.82	0.91	0.87
Iterated SVM cost 5 gamma 0.01	0.86	0.91	0.88
Nmodels SVM cost 1 gamma 0.001	0.95	0.82	0.89
Iterated SVM cost 1 gamma 0.05	0.88	0.92	0.9
Iterated QRF ntree 500	0.88	0.94	0.91
Iterated QRF ntree 1000	0.88	0.94	0.91
Iterated QRF ntree 1500	0.89	0.94	0.92
Iterated SVM cost 50 gamma 0.01	0.85	0.99	0.92
Iterated SVM cost 1 gamma 0.001	0.99	0.87	0.93
Iterated RF ntree 1000	0.95	0.93	0.94
Iterated RF ntree 1500	0.95	0.93	0.94
Iterated SVM cost 100 gamma 0.01	0.89	1	0.95
Iterated RF ntree 500	0.95	0.94	0.95
Iterated RT se 1.5	0.95	0.95	0.95
Iterated SVM cost 1 gamma 0.01	0.97	0.93	0.95
Iterated RT se 1	0.96	0.95	0.96
Iterated RT se 0.5	0.97	0.96	0.96
Iterated RT se 0	0.98	0.97	0.98
Iterated SVM cost 1 gamma 0.1	0.93	1.03	0.98
Iterated SVM cost 5 gamma 0.05	0.95	1.03	0.99
Iterated SVM cost 10 gamma 0.05	0.99	1.14	1.06
Iterated SVM cost 50 gamma 0.05	1.03	1.2	1.12
Iterated SVM cost 5 gamma 0.1	1.02	1.22	1.12
Iterated SVM cost 100 gamma 0.05	1.07	1.21	1.14

Iterated SVM cost 10 gamma 0.1	1.07	1.23	1.15
Iterated SVM cost 50 gamma 0.1	1.1	1.21	1.15
Iterated SVM cost 100 gamma 0.1	1.14	1.26	1.2
RW	1.07	1.64	1.35

Table 3.7: All setups MAQ



### 3.3.2 TQE - Total Quantile Error

Figure 3.8 shows the results using the TQE error measure for all different setups.

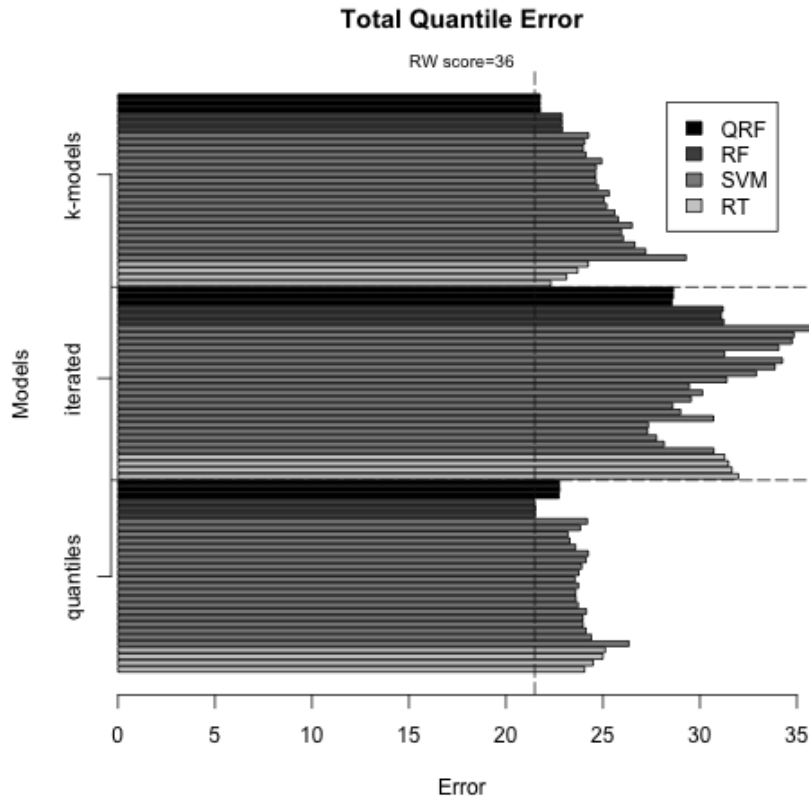


Figure 3.8: Stream 3

Table 3.8 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile RF ntree 1500	10.51	10.97	21.49
Quantile RF ntree 500	10.51	10.99	21.51
Quantile RF ntree 1000	10.52	10.99	21.51
Nmodels QRF ntree 1000	10.47	11.3	21.76
Nmodels QRF ntree 1500	10.46	11.3	21.77
Nmodels QRF ntree 500	10.46	11.31	21.77
Nmodels RT se 0	10.98	11.33	22.31

Quantile QRF ntree 500	11.09	11.65	22.75
Quantile QRF ntree 1500	11.11	11.65	22.76
Quantile QRF ntree 1000	11.12	11.65	22.77
Nmodels RF ntree 1500	11.49	11.4	22.89
Nmodels RF ntree 1000	11.5	11.4	22.89
Nmodels RF ntree 500	11.5	11.41	22.9
Nmodels RT se 0.5	11.47	11.65	23.12
Quantile SVM cost 10 gamma 0.1	11.28	11.92	23.19
Quantile SVM cost 5 gamma 0.1	11.33	11.97	23.3
Quantile SVM cost 1 gamma 0.05	11.38	12.17	23.56
Quantile SVM cost 1 gamma 0.1	11.46	12.13	23.58
Quantile SVM cost 50 gamma 0.01	11.44	12.15	23.59
Quantile SVM cost 10 gamma 0.01	11.48	12.12	23.61
Nmodels RT se 1	11.7	11.99	23.69
Quantile SVM cost 5 gamma 0.01	11.58	12.14	23.72
Quantile SVM cost 100 gamma 0.01	11.53	12.2	23.74
Quantile SVM cost 5 gamma 0.05	11.61	12.15	23.76
Quantile SVM cost 50 gamma 0.1	11.67	12.17	23.83
Quantile SVM cost 10 gamma 0.05	11.72	12.18	23.91
Quantile SVM cost 100 gamma 0.001	11.76	12.2	23.96
Quantile SVM cost 50 gamma 0.001	11.79	12.19	23.97
Nmodels SVM cost 10 gamma 0.1	11.9	12.08	23.98
Quantile RT se 0	11.99	12.06	24.05
Nmodels SVM cost 50 gamma 0.1	11.82	12.24	24.06
Nmodels SVM cost 5 gamma 0.1	12.04	12.08	24.12
Quantile SVM cost 50 gamma 0.05	11.76	12.37	24.12
Quantile SVM cost 10 gamma 0.001	11.9	12.24	24.13
Quantile SVM cost 1 gamma 0.01	11.91	12.24	24.14
Quantile SVM cost 100 gamma 0.1	11.91	12.29	24.19
Nmodels RT se 1.5	11.96	12.28	24.24
Quantile SVM cost 100 gamma 0.05	11.8	12.44	24.24
Nmodels SVM cost 100 gamma 0.1	11.93	12.33	24.26
Quantile SVM cost 5 gamma 0.001	12.03	12.38	24.41
Quantile RT se 0.5	12.07	12.42	24.49
Nmodels SVM cost 50 gamma 0.05	12.19	12.43	24.63
Nmodels SVM cost 10 gamma 0.05	12.23	12.41	24.64
Nmodels SVM cost 100 gamma 0.05	12.16	12.49	24.65
Nmodels SVM cost 5 gamma 0.05	12.3	12.44	24.74
Nmodels SVM cost 1 gamma 0.1	12.52	12.41	24.93
Quantile RT se 1	12.22	12.78	24.99
Nmodels SVM cost 100 gamma 0.01	12.44	12.61	25.06

Quantile RT se 1.5	12.36	12.76	25.12
Nmodels SVM cost 50 gamma 0.01	12.6	12.6	25.2
Nmodels SVM cost 1 gamma 0.05	12.8	12.51	25.32
Nmodels SVM cost 10 gamma 0.01	13.02	12.59	25.6
Nmodels SVM cost 5 gamma 0.01	13.23	12.56	25.79
Nmodels SVM cost 100 gamma 0.001	13.42	12.53	25.95
Nmodels SVM cost 50 gamma 0.001	13.56	12.49	26.05
Quantile SVM cost 1 gamma 0.001	12.77	13.57	26.34
Nmodels SVM cost 1 gamma 0.01	13.94	12.56	26.5
Nmodels SVM cost 10 gamma 0.001	14.05	12.59	26.64
Nmodels SVM cost 5 gamma 0.001	14.41	12.79	27.2
Iterated SVM cost 50 gamma 0.001	13.7	13.6	27.3
Iterated SVM cost 100 gamma 0.001	13.64	13.71	27.34
Iterated SVM cost 10 gamma 0.001	14.5	13.26	27.76
Iterated SVM cost 5 gamma 0.001	14.59	13.57	28.16
Iterated QRF ntree 500	13.97	14.59	28.56
Iterated SVM cost 10 gamma 0.01	13.62	14.97	28.6
Iterated QRF ntree 1000	14.03	14.59	28.62
Iterated QRF ntree 1500	14.01	14.61	28.63
Iterated SVM cost 5 gamma 0.01	14.05	14.95	29
Nmodels SVM cost 1 gamma 0.001	15.47	13.81	29.28
Iterated SVM cost 1 gamma 0.05	14.23	15.22	29.45
Iterated SVM cost 50 gamma 0.01	13.98	15.56	29.55
Iterated SVM cost 100 gamma 0.01	14.43	15.7	30.13
Iterated SVM cost 1 gamma 0.01	15.75	14.95	30.7
Iterated SVM cost 1 gamma 0.001	16.23	14.49	30.71
Iterated RF ntree 1000	15.78	15.32	31.1
Iterated RF ntree 1500	15.83	15.36	31.19
Iterated RF ntree 500	15.8	15.42	31.23
Iterated SVM cost 1 gamma 0.1	15.24	16.03	31.27
Iterated RT se 1.5	15.69	15.58	31.27
Iterated SVM cost 5 gamma 0.05	15.41	15.97	31.38
Iterated RT se 1	15.84	15.63	31.47
Iterated RT se 0.5	15.97	15.68	31.65
Iterated RT se 0	16.16	15.83	31.98
Iterated SVM cost 10 gamma 0.05	15.96	16.95	32.9
Iterated SVM cost 50 gamma 0.05	16.39	17.48	33.87
Iterated SVM cost 5 gamma 0.1	16.24	17.82	34.06
Iterated SVM cost 100 gamma 0.05	16.79	17.46	34.25
Iterated SVM cost 10 gamma 0.1	16.86	17.88	34.75
Iterated SVM cost 50 gamma 0.1	17.32	17.52	34.85

RW	15.66	19.97	35.62
Iterated SVM cost 100 gamma 0.1	17.89	17.92	35.81

Table 3.8: All setups TQE

### 3.3.3 Utility

Figure 3.9 shows the results using the Utility error measure (larger is better) for all different setups.

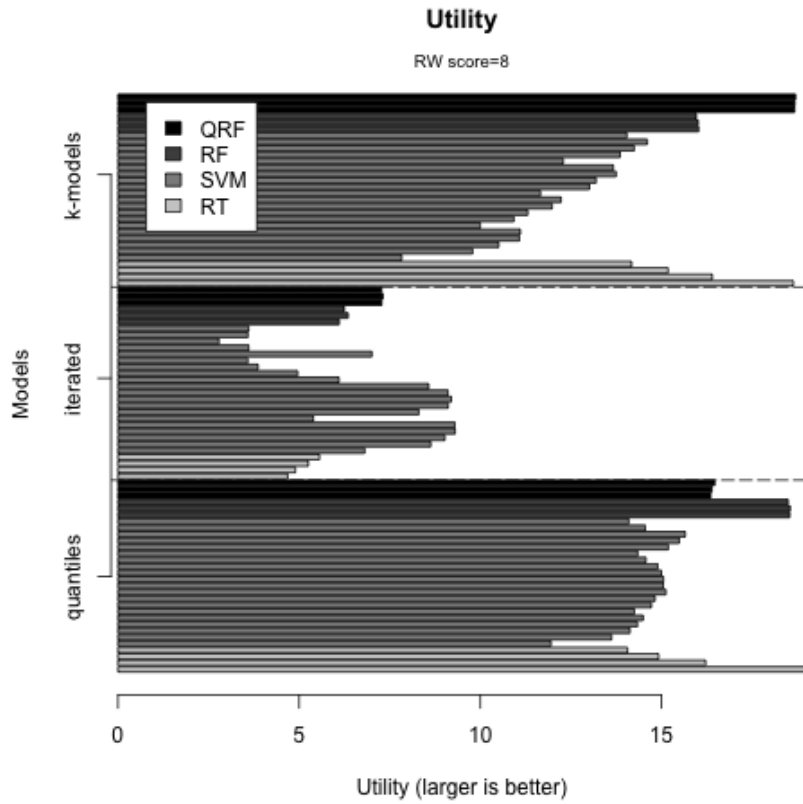


Figure 3.9: Stream 3

Table 3.9 shows all setups order by the Utility.

	utility
Quantile RT se 0	19.17
Nmodels QRF ntree 1500	18.69
Nmodels QRF ntree 1000	18.68
Nmodels QRF ntree 500	18.67
Nmodels RT se 0	18.63
Quantile RF ntree 1000	18.55
Quantile RF ntree 500	18.54

Quantile RF ntree 1500	18.49
Quantile QRF ntree 1500	16.47
Nmodels RT se 0.5	16.4
Quantile QRF ntree 1000	16.39
Quantile QRF ntree 500	16.36
Quantile RT se 0.5	16.21
Nmodels RF ntree 500	16.02
Nmodels RF ntree 1000	16.01
Nmodels RF ntree 1500	15.96
Quantile SVM cost 10 gamma 0.1	15.65
Quantile SVM cost 5 gamma 0.1	15.48
Quantile SVM cost 1 gamma 0.1	15.18
Nmodels RT se 1	15.18
Quantile SVM cost 50 gamma 0.01	15.12
Quantile SVM cost 1 gamma 0.05	15.05
Quantile SVM cost 100 gamma 0.01	15.04
Quantile SVM cost 5 gamma 0.05	14.99
Quantile RT se 1	14.92
Quantile SVM cost 10 gamma 0.05	14.89
Quantile SVM cost 10 gamma 0.01	14.82
Quantile SVM cost 5 gamma 0.01	14.72
Nmodels SVM cost 50 gamma 0.1	14.6
Quantile SVM cost 50 gamma 0.05	14.57
Quantile SVM cost 50 gamma 0.1	14.55
Quantile SVM cost 100 gamma 0.001	14.49
Quantile SVM cost 100 gamma 0.05	14.34
Quantile SVM cost 50 gamma 0.001	14.33
Quantile SVM cost 1 gamma 0.01	14.24
Nmodels SVM cost 10 gamma 0.1	14.24
Nmodels RT se 1.5	14.17
Quantile SVM cost 10 gamma 0.001	14.13
Quantile SVM cost 100 gamma 0.1	14.09
Quantile RT se 1.5	14.06
Nmodels SVM cost 100 gamma 0.1	14.04
Nmodels SVM cost 5 gamma 0.1	13.85
Nmodels SVM cost 50 gamma 0.05	13.74
Nmodels SVM cost 100 gamma 0.05	13.67
Quantile SVM cost 5 gamma 0.001	13.62
Nmodels SVM cost 10 gamma 0.05	13.19
Nmodels SVM cost 5 gamma 0.05	13.01
Nmodels SVM cost 1 gamma 0.1	12.29

Nmodels SVM cost 100 gamma 0.01	12.22
Nmodels SVM cost 50 gamma 0.01	11.98
Quantile SVM cost 1 gamma 0.001	11.95
Nmodels SVM cost 1 gamma 0.05	11.66
Nmodels SVM cost 10 gamma 0.01	11.31
Nmodels SVM cost 100 gamma 0.001	11.1
Nmodels SVM cost 50 gamma 0.001	11.07
Nmodels SVM cost 5 gamma 0.01	10.92
Nmodels SVM cost 10 gamma 0.001	10.51
Nmodels SVM cost 1 gamma 0.01	10
Nmodels SVM cost 5 gamma 0.001	9.78
Iterated SVM cost 50 gamma 0.001	9.3
Iterated SVM cost 100 gamma 0.001	9.29
Iterated SVM cost 50 gamma 0.01	9.2
Iterated SVM cost 10 gamma 0.01	9.11
Iterated SVM cost 100 gamma 0.01	9.1
Iterated SVM cost 10 gamma 0.001	9.02
Iterated SVM cost 5 gamma 0.001	8.63
Iterated SVM cost 1 gamma 0.05	8.57
Iterated SVM cost 5 gamma 0.01	8.3
RW	7.87
Nmodels SVM cost 1 gamma 0.001	7.83
Iterated QRF ntree 1000	7.32
Iterated QRF ntree 500	7.28
Iterated QRF ntree 1500	7.27
Iterated SVM cost 1 gamma 0.1	7
Iterated SVM cost 1 gamma 0.001	6.81
Iterated RF ntree 1000	6.35
Iterated RF ntree 1500	6.25
Iterated RF ntree 500	6.1
Iterated SVM cost 5 gamma 0.05	6.1
Iterated RT se 1.5	5.56
Iterated SVM cost 1 gamma 0.01	5.39
Iterated RT se 1	5.25
Iterated SVM cost 10 gamma 0.05	4.96
Iterated RT se 0.5	4.9
Iterated RT se 0	4.68
Iterated SVM cost 50 gamma 0.05	3.86
Iterated SVM cost 5 gamma 0.1	3.61
Iterated SVM cost 100 gamma 0.1	3.6
Iterated SVM cost 50 gamma 0.1	3.58

Iterated SVM cost 100 gamma 0.05	3.58
Iterated SVM cost 10 gamma 0.1	2.79

Table 3.9: All setups Utility



### 3.4 Stream 4

#### 3.4.1 MAQ - Mean Absolute Quantile Deviation

Figure 3.10 shows the results using the MAQ error measure for all different setups.

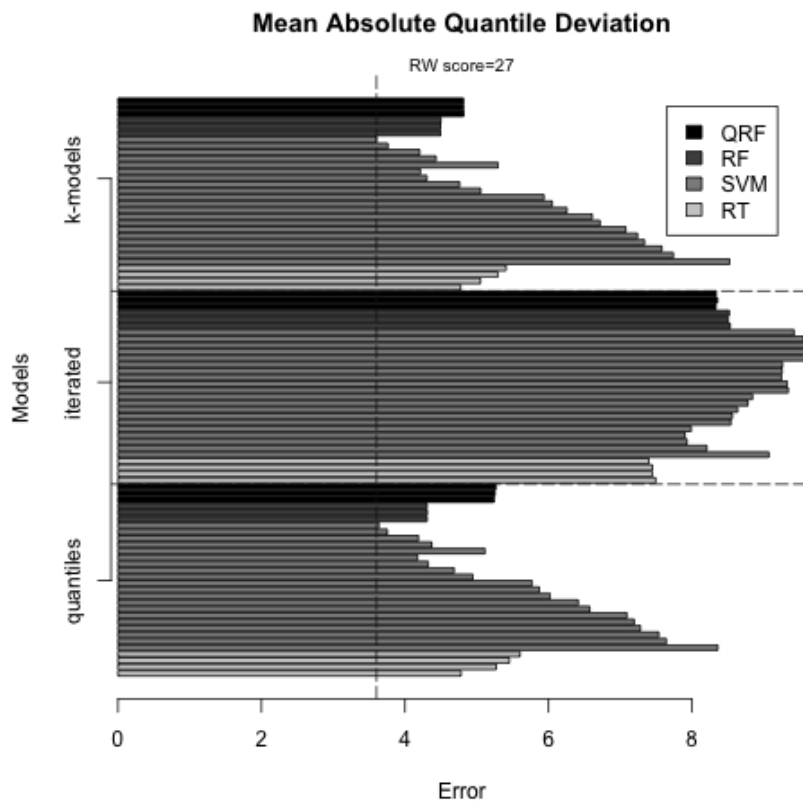


Figure 3.10: Stream 4

Table 3.10 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Nmodels SVM cost 100 gamma 0.1	3.51	3.7	3.6
Quantile SVM cost 100 gamma 0.1	3.66	3.61	3.64
Quantile SVM cost 50 gamma 0.1	3.73	3.78	3.75
Nmodels SVM cost 50 gamma 0.1	3.66	3.86	3.76
Quantile SVM cost 100 gamma 0.05	4.2	4.15	4.17

Quantile SVM cost 10 gamma 0.1	4.22	4.15	4.19
Nmodels SVM cost 10 gamma 0.1	4.17	4.24	4.2
Nmodels SVM cost 100 gamma 0.05	4.15	4.27	4.21
Nmodels SVM cost 50 gamma 0.05	4.2	4.41	4.3
Quantile RF ntree 1500	4.34	4.27	4.31
Quantile RF ntree 500	4.34	4.27	4.31
Quantile RF ntree 1000	4.34	4.27	4.31
Quantile SVM cost 50 gamma 0.05	4.37	4.27	4.32
Quantile SVM cost 5 gamma 0.1	4.41	4.34	4.37
Nmodels SVM cost 5 gamma 0.1	4.4	4.47	4.43
Nmodels RF ntree 1000	4.41	4.58	4.49
Nmodels RF ntree 500	4.42	4.57	4.5
Nmodels RF ntree 1500	4.42	4.58	4.5
Quantile SVM cost 10 gamma 0.05	4.75	4.62	4.68
Nmodels SVM cost 10 gamma 0.05	4.72	4.8	4.76
Nmodels RT se 0	4.89	4.66	4.77
Quantile RT se 0	5.09	4.48	4.78
Nmodels QRF ntree 1500	4.85	4.78	4.81
Nmodels QRF ntree 1000	4.85	4.79	4.82
Nmodels QRF ntree 500	4.85	4.78	4.82
Quantile SVM cost 5 gamma 0.05	5.02	4.87	4.95
Nmodels RT se 0.5	5.1	5	5.05
Nmodels SVM cost 5 gamma 0.05	5.09	5.02	5.05
Quantile SVM cost 1 gamma 0.1	5.15	5.08	5.11
Quantile QRF ntree 500	5.24	5.24	5.24
Quantile QRF ntree 1000	5.18	5.33	5.25
Quantile QRF ntree 1500	5.23	5.29	5.26
Quantile RT se 0.5	5.62	4.92	5.27
Nmodels RT se 1	5.27	5.32	5.29
Nmodels SVM cost 1 gamma 0.1	5.3	5.3	5.3
Nmodels RT se 1.5	5.36	5.45	5.41
Quantile RT se 1	5.78	5.13	5.45
Quantile RT se 1.5	5.88	5.33	5.6
Quantile SVM cost 1 gamma 0.05	5.81	5.72	5.77
Quantile SVM cost 100 gamma 0.01	6	5.75	5.87
Nmodels SVM cost 1 gamma 0.05	6.07	5.81	5.94
Quantile SVM cost 50 gamma 0.01	6.14	5.91	6.02
Nmodels SVM cost 100 gamma 0.01	6.26	5.84	6.05
Nmodels SVM cost 50 gamma 0.01	6.54	5.97	6.26
Quantile SVM cost 10 gamma 0.01	6.57	6.25	6.41
Quantile SVM cost 5 gamma 0.01	6.73	6.42	6.57

Nmodels SVM cost 10 gamma 0.01	7	6.21	6.61
Nmodels SVM cost 5 gamma 0.01	7.08	6.35	6.72
Nmodels SVM cost 1 gamma 0.01	7.18	6.97	7.08
Quantile SVM cost 1 gamma 0.01	7.04	7.14	7.09
Quantile SVM cost 100 gamma 0.001	7.36	7.02	7.19
Nmodels SVM cost 100 gamma 0.001	7.52	6.95	7.24
Quantile SVM cost 50 gamma 0.001	7.41	7.15	7.28
Nmodels SVM cost 50 gamma 0.001	7.55	7.13	7.34
Iterated RT se 1.5	7.45	7.35	7.4
Iterated RT se 0.5	7.5	7.39	7.44
Iterated RT se 1	7.5	7.38	7.44
Iterated RT se 0	7.6	7.38	7.49
Quantile SVM cost 10 gamma 0.001	7.64	7.43	7.54
Nmodels SVM cost 10 gamma 0.001	7.68	7.47	7.58
Quantile SVM cost 5 gamma 0.001	7.71	7.57	7.64
Nmodels SVM cost 5 gamma 0.001	7.81	7.67	7.74
Iterated SVM cost 50 gamma 0.001	7.79	8.01	7.9
Iterated SVM cost 10 gamma 0.001	7.93	7.93	7.93
Iterated SVM cost 100 gamma 0.001	7.99	7.98	7.99
Iterated SVM cost 5 gamma 0.001	8.05	8.36	8.2
Iterated QRF ntree 500	7.96	8.7	8.33
Iterated QRF ntree 1500	7.97	8.7	8.33
Iterated QRF ntree 1000	7.98	8.73	8.35
Quantile SVM cost 1 gamma 0.001	8.32	8.4	8.36
Iterated RF ntree 1000	8.3	8.7	8.5
Iterated RF ntree 1500	8.3	8.73	8.52
Nmodels SVM cost 1 gamma 0.001	8.53	8.51	8.52
Iterated RF ntree 500	8.28	8.78	8.53
Iterated SVM cost 1 gamma 0.01	8.55	8.52	8.54
Iterated SVM cost 5 gamma 0.01	8.62	8.51	8.56
Iterated SVM cost 10 gamma 0.01	8.72	8.55	8.64
Iterated SVM cost 50 gamma 0.01	8.92	8.64	8.78
Iterated SVM cost 100 gamma 0.01	9.04	8.64	8.84
Iterated SVM cost 1 gamma 0.001	9.04	9.1	9.07
Iterated SVM cost 10 gamma 0.05	9.25	9.24	9.24
Iterated SVM cost 50 gamma 0.05	9.3	9.21	9.25
Iterated SVM cost 100 gamma 0.05	9.25	9.27	9.26
Iterated SVM cost 5 gamma 0.05	9.29	9.36	9.32
Iterated SVM cost 1 gamma 0.05	9.21	9.47	9.34
Iterated SVM cost 100 gamma 0.1	9.35	9.49	9.42
Iterated SVM cost 50 gamma 0.1	9.47	9.64	9.56

Iterated SVM cost 5 gamma 0.1	9.48	9.7	9.59
Iterated SVM cost 10 gamma 0.1	9.55	9.71	9.63
Iterated SVM cost 1 gamma 0.1	9.51	9.85	9.68
RW	23.55	29.53	26.54

Table 3.10: All setups MAQ

### 3.4.2 TQE - Total Quantile Error

Figure 3.11 shows the results using the TQE error measure for all different setups.

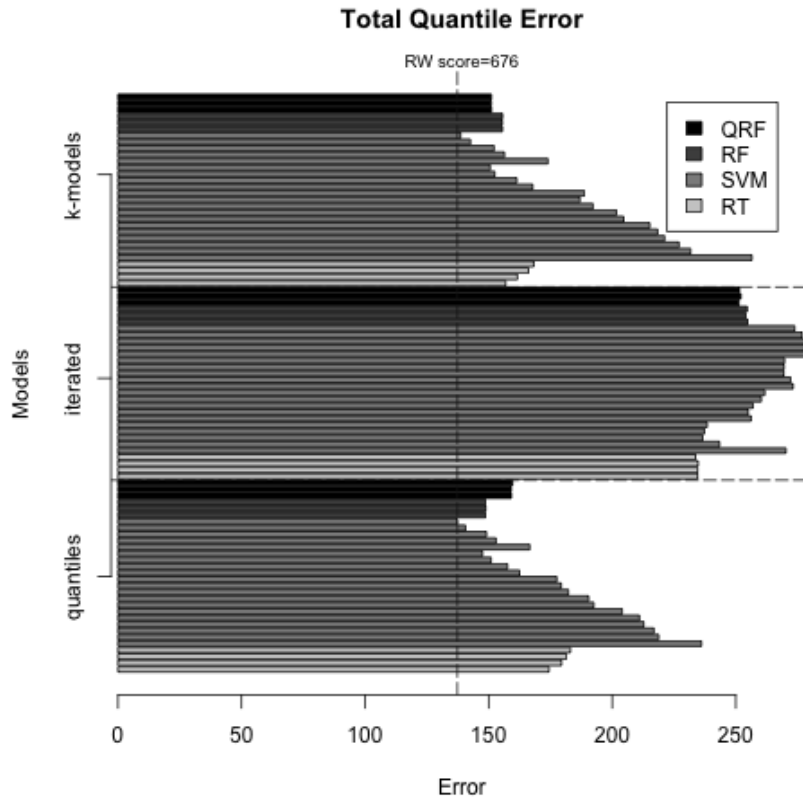


Figure 3.11: Stream 4

Table 3.11 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile SVM cost 100 gamma 0.1	66.97	70.33	137.3
Nmodels SVM cost 100 gamma 0.1	65.41	73.24	138.65
Quantile SVM cost 50 gamma 0.1	68.16	72.45	140.61
Nmodels SVM cost 50 gamma 0.1	67.26	75.35	142.61
Quantile SVM cost 100 gamma 0.05	70.89	76.63	147.52
Quantile RF ntree 1500	74.3	74.4	148.7
Quantile RF ntree 500	74.34	74.38	148.73

Quantile RF ntree 1000	74.35	74.44	148.79
Quantile SVM cost 10 gamma 0.1	72.29	76.81	149.1
Nmodels SVM cost 100 gamma 0.05	70.01	80.6	150.61
Quantile SVM cost 50 gamma 0.05	72.82	78.15	150.97
Nmodels QRF ntree 1000	74.98	76.08	151.06
Nmodels QRF ntree 1500	75.06	76.05	151.11
Nmodels QRF ntree 500	75.06	76.09	151.14
Nmodels SVM cost 10 gamma 0.1	71.92	80.25	152.17
Nmodels SVM cost 50 gamma 0.05	70.76	81.69	152.45
Quantile SVM cost 5 gamma 0.1	73.95	79.01	152.96
Nmodels RF ntree 1000	75.28	80.25	155.53
Nmodels RF ntree 500	75.38	80.2	155.59
Nmodels RF ntree 1500	75.36	80.26	155.62
Nmodels SVM cost 5 gamma 0.1	73.81	82.55	156.36
Nmodels RT se 0	79.99	76.88	156.86
Quantile SVM cost 10 gamma 0.05	76.53	81.09	157.62
Quantile QRF ntree 1000	77.32	81.84	159.16
Quantile QRF ntree 500	78.18	81.02	159.2
Quantile QRF ntree 1500	78.02	81.66	159.67
Nmodels SVM cost 10 gamma 0.05	75.95	85.44	161.39
Nmodels RT se 0.5	81.78	79.84	161.61
Quantile SVM cost 5 gamma 0.05	79.11	83.43	162.54
Nmodels RT se 1	83.12	82.96	166.07
Quantile SVM cost 1 gamma 0.1	80.31	86.32	166.63
Nmodels SVM cost 5 gamma 0.05	79.98	87.84	167.82
Nmodels RT se 1.5	83.99	84.25	168.25
Nmodels SVM cost 1 gamma 0.1	82.43	91.52	173.95
Quantile RT se 0	93.36	81.06	174.42
Quantile SVM cost 1 gamma 0.05	87.5	90.05	177.55
Quantile SVM cost 100 gamma 0.01	90.69	88.65	179.35
Quantile RT se 0.5	95.81	83.67	179.49
Quantile RT se 1	97.23	84.18	181.41
Quantile SVM cost 50 gamma 0.01	92.59	89.65	182.24
Quantile RT se 1.5	97.78	85.31	183.09
Nmodels SVM cost 100 gamma 0.01	94.22	92.69	186.91
Nmodels SVM cost 1 gamma 0.05	92.79	95.93	188.72
Quantile SVM cost 10 gamma 0.01	97.44	93.03	190.48
Nmodels SVM cost 50 gamma 0.01	98.31	93.86	192.18
Quantile SVM cost 5 gamma 0.01	97.74	94.8	192.54
Nmodels SVM cost 10 gamma 0.01	104.05	97.61	201.66
Quantile SVM cost 1 gamma 0.01	101.42	102.58	204

Nmodels SVM cost 5 gamma 0.01	104.91	99.71	204.62
Quantile SVM cost 100 gamma 0.001	105.8	105.2	211
Quantile SVM cost 50 gamma 0.001	107.21	105.54	212.74
Nmodels SVM cost 1 gamma 0.01	108.49	106.71	215.2
Quantile SVM cost 10 gamma 0.001	111.19	105.65	216.84
Nmodels SVM cost 100 gamma 0.001	110.55	107.8	218.35
Quantile SVM cost 5 gamma 0.001	112.65	106.16	218.81
Nmodels SVM cost 50 gamma 0.001	112.08	109.09	221.17
Nmodels SVM cost 10 gamma 0.001	116.8	110.19	226.99
Nmodels SVM cost 5 gamma 0.001	120.14	111.57	231.71
Iterated RT se 1.5	117.98	115.7	233.68
Iterated RT se 0	118.78	115.74	234.52
Iterated RT se 0.5	118.5	116.03	234.53
Iterated RT se 1	118.67	116.07	234.75
Quantile SVM cost 1 gamma 0.001	123.83	112.28	236.11
Iterated SVM cost 10 gamma 0.001	122.63	113.94	236.57
Iterated SVM cost 50 gamma 0.001	119.31	117.94	237.25
Iterated SVM cost 100 gamma 0.001	121.82	116.6	238.43
Iterated SVM cost 5 gamma 0.001	126.5	116.92	243.42
Iterated QRF ntree 500	119.41	131.86	251.27
Iterated QRF ntree 1500	119.49	131.99	251.48
Iterated QRF ntree 1000	119.65	132.43	252.08
Iterated RF ntree 1000	126.55	127.47	254.02
Iterated RF ntree 1500	126.58	128.02	254.6
Iterated RF ntree 500	126.32	128.49	254.81
Iterated SVM cost 5 gamma 0.01	132.62	122.37	255
Iterated SVM cost 1 gamma 0.01	134.6	121.56	256.16
Nmodels SVM cost 1 gamma 0.001	135.42	121.1	256.52
Iterated SVM cost 10 gamma 0.01	134.2	122.73	256.93
Iterated SVM cost 50 gamma 0.01	135.42	124.87	260.29
Iterated SVM cost 100 gamma 0.01	137.63	124.12	261.74
Iterated SVM cost 10 gamma 0.05	141.57	127.85	269.42
Iterated SVM cost 50 gamma 0.05	142.83	126.71	269.53
Iterated SVM cost 100 gamma 0.05	142.47	127.25	269.72
Iterated SVM cost 1 gamma 0.001	146.72	123.57	270.29
Iterated SVM cost 5 gamma 0.05	142.15	130	272.15
Iterated SVM cost 1 gamma 0.05	142.94	130.25	273.19
Iterated SVM cost 100 gamma 0.1	144.77	129.05	273.82
Iterated SVM cost 50 gamma 0.1	146.52	130.38	276.9
Iterated SVM cost 5 gamma 0.1	147.5	130.45	277.95
Iterated SVM cost 10 gamma 0.1	148.51	130.37	278.87

Iterated SVM cost 1 gamma 0.1	149.6	131.52	281.11
RW	371.9	303.78	675.68

Table 3.11: All setups TQE



### 3.4.3 Utility

Figure 3.12 shows the results using the Utility error measure (larger is better) for all different setups.

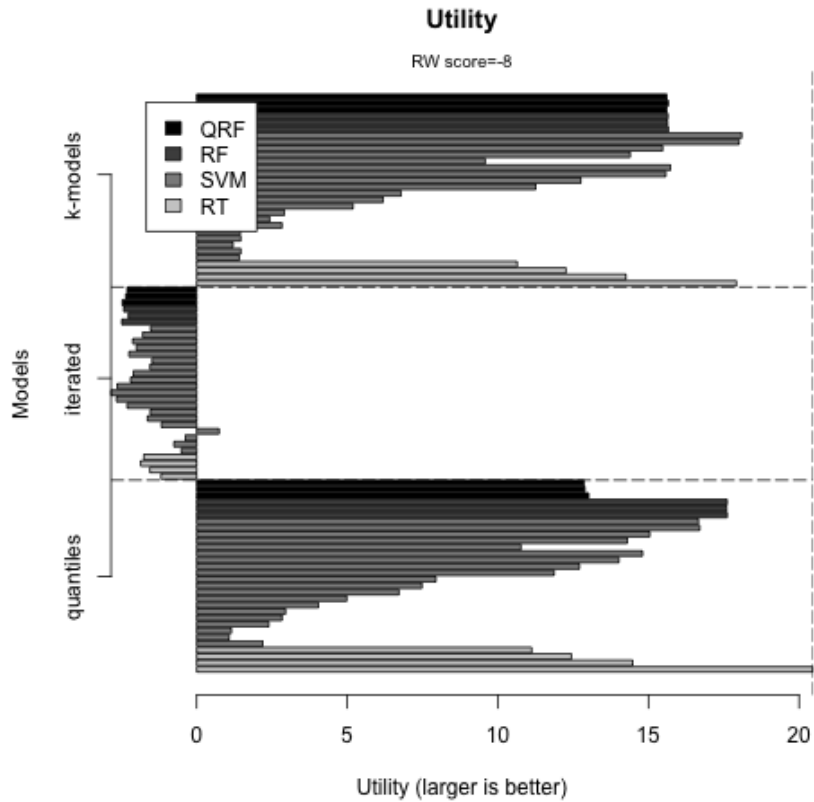


Figure 3.12: Stream 4

Table 3.12 shows all setups order by the Utility.

	utility
Quantile RT se 0	20.45
Nmodels SVM cost 100 gamma 0.1	18.1
Nmodels SVM cost 50 gamma 0.1	18.01
Nmodels RT se 0	17.92
Quantile RF ntree 500	17.61
Quantile RF ntree 1500	17.61
Quantile RF ntree 1000	17.59

Quantile SVM cost 50 gamma 0.1	16.7
Quantile SVM cost 100 gamma 0.1	16.66
Nmodels SVM cost 100 gamma 0.05	15.73
Nmodels RF ntree 500	15.66
Nmodels QRF ntree 1000	15.66
Nmodels RF ntree 1500	15.65
Nmodels RF ntree 1000	15.63
Nmodels QRF ntree 1500	15.61
Nmodels QRF ntree 500	15.6
Nmodels SVM cost 50 gamma 0.05	15.58
Nmodels SVM cost 10 gamma 0.1	15.47
Quantile SVM cost 10 gamma 0.1	15.04
Quantile SVM cost 100 gamma 0.05	14.8
Quantile RT se 0.5	14.48
Nmodels SVM cost 5 gamma 0.1	14.39
Quantile SVM cost 5 gamma 0.1	14.3
Nmodels RT se 0.5	14.25
Quantile SVM cost 50 gamma 0.05	14.02
Quantile QRF ntree 500	13.02
Quantile QRF ntree 1000	12.89
Quantile QRF ntree 1500	12.86
Nmodels SVM cost 10 gamma 0.05	12.75
Quantile SVM cost 10 gamma 0.05	12.71
Quantile RT se 1	12.44
Nmodels RT se 1	12.26
Quantile SVM cost 5 gamma 0.05	11.87
Nmodels SVM cost 5 gamma 0.05	11.26
Quantile RT se 1.5	11.12
Quantile SVM cost 1 gamma 0.1	10.77
Nmodels RT se 1.5	10.64
Nmodels SVM cost 1 gamma 0.1	9.58
Quantile SVM cost 1 gamma 0.05	7.94
Quantile SVM cost 100 gamma 0.01	7.48
Nmodels SVM cost 1 gamma 0.05	6.79
Quantile SVM cost 50 gamma 0.01	6.72
Nmodels SVM cost 100 gamma 0.01	6.19
Nmodels SVM cost 50 gamma 0.01	5.19
Quantile SVM cost 10 gamma 0.01	4.98
Quantile SVM cost 5 gamma 0.01	4.05
Quantile SVM cost 1 gamma 0.01	2.95
Nmodels SVM cost 10 gamma 0.01	2.91

Quantile SVM cost 100 gamma 0.001	2.83
Nmodels SVM cost 1 gamma 0.01	2.83
Nmodels SVM cost 5 gamma 0.01	2.42
Quantile SVM cost 50 gamma 0.001	2.39
Quantile SVM cost 1 gamma 0.001	2.19
Nmodels SVM cost 5 gamma 0.001	1.47
Nmodels SVM cost 50 gamma 0.001	1.46
Nmodels SVM cost 100 gamma 0.001	1.45
Nmodels SVM cost 1 gamma 0.001	1.41
Nmodels SVM cost 10 gamma 0.001	1.21
Quantile SVM cost 10 gamma 0.001	1.15
Quantile SVM cost 5 gamma 0.001	1.08
Iterated SVM cost 50 gamma 0.001	0.75
Iterated SVM cost 10 gamma 0.001	-0.38
Iterated SVM cost 1 gamma 0.001	-0.51
Iterated SVM cost 5 gamma 0.001	-0.75
Iterated SVM cost 100 gamma 0.001	-1.17
Iterated RT se 0	-1.18
Iterated SVM cost 100 gamma 0.05	-1.48
Iterated SVM cost 100 gamma 0.1	-1.53
Iterated SVM cost 5 gamma 0.01	-1.54
Iterated SVM cost 50 gamma 0.05	-1.55
Iterated RT se 0.5	-1.55
Iterated SVM cost 1 gamma 0.01	-1.63
Iterated RT se 1.5	-1.75
Iterated SVM cost 50 gamma 0.1	-1.79
Iterated RT se 1	-1.86
Iterated SVM cost 5 gamma 0.1	-2
Iterated SVM cost 10 gamma 0.05	-2.11
Iterated SVM cost 10 gamma 0.1	-2.12
Iterated SVM cost 5 gamma 0.05	-2.19
Iterated SVM cost 1 gamma 0.1	-2.25
Iterated RF ntree 1000	-2.27
Iterated SVM cost 10 gamma 0.01	-2.31
Iterated QRF ntree 1500	-2.31
Iterated QRF ntree 1000	-2.35
Iterated RF ntree 1500	-2.42
Iterated QRF ntree 500	-2.47
Iterated RF ntree 500	-2.49
Iterated SVM cost 1 gamma 0.05	-2.64
Iterated SVM cost 50 gamma 0.01	-2.66

Iterated SVM cost 100 gamma 0.01	-2.84
RW	-7.87

Table 3.12: All setups Utility

### 3.5 Stream 5

#### 3.5.1 MAQ - Mean Absolute Quantile Deviation

Figure 3.13 shows the results using the MAQ error measure for all different setups.

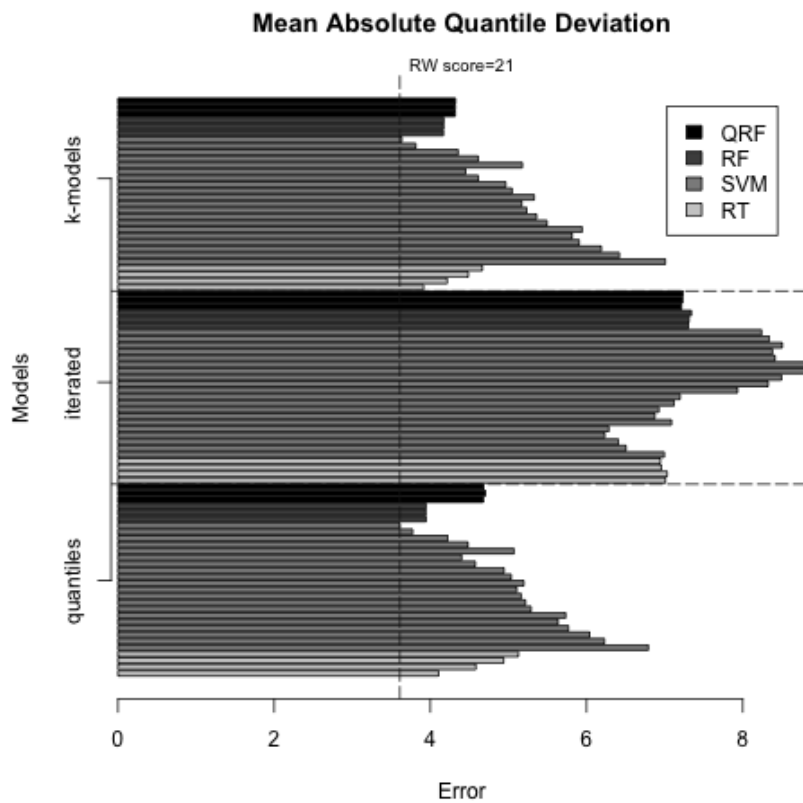


Figure 3.13: Stream 5

Table 3.13 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Quantile SVM cost 100 gamma 0.1	3.72	3.5	3.61
Nmodels SVM cost 100 gamma 0.1	3.8	3.47	3.63
Quantile SVM cost 50 gamma 0.1	3.89	3.66	3.77
Nmodels SVM cost 50 gamma 0.1	4.02	3.6	3.81
Nmodels RT se 0	3.82	4.01	3.91

Quantile RF ntree 1000	4.11	3.77	3.94
Quantile RF ntree 1500	4.11	3.78	3.94
Quantile RF ntree 500	4.11	3.78	3.94
Quantile RT se 0	4.4	3.81	4.11
Nmodels RF ntree 500	4.54	3.79	4.17
Nmodels RF ntree 1000	4.55	3.79	4.17
Nmodels RF ntree 1500	4.55	3.8	4.17
Nmodels RT se 0.5	4.23	4.2	4.21
Quantile SVM cost 10 gamma 0.1	4.41	4.04	4.22
Nmodels QRF ntree 500	4.24	4.39	4.32
Nmodels QRF ntree 1000	4.24	4.4	4.32
Nmodels QRF ntree 1500	4.24	4.4	4.32
Nmodels SVM cost 10 gamma 0.1	4.65	4.06	4.35
Quantile SVM cost 100 gamma 0.05	4.57	4.23	4.4
Nmodels SVM cost 100 gamma 0.05	4.72	4.18	4.45
Quantile SVM cost 5 gamma 0.1	4.71	4.25	4.48
Nmodels RT se 1	4.65	4.32	4.49
Quantile SVM cost 50 gamma 0.05	4.78	4.37	4.58
Quantile RT se 0.5	4.9	4.27	4.58
Nmodels SVM cost 5 gamma 0.1	4.96	4.27	4.61
Nmodels SVM cost 50 gamma 0.05	4.88	4.35	4.61
Nmodels RT se 1.5	4.9	4.43	4.67
Quantile QRF ntree 500	4.62	4.74	4.68
Quantile QRF ntree 1500	4.66	4.71	4.68
Quantile QRF ntree 1000	4.65	4.76	4.7
Quantile RT se 1	5.37	4.51	4.94
Quantile SVM cost 10 gamma 0.05	5.22	4.66	4.94
Nmodels SVM cost 10 gamma 0.05	5.3	4.63	4.96
Quantile SVM cost 5 gamma 0.05	5.3	4.77	5.04
Nmodels SVM cost 5 gamma 0.05	5.41	4.68	5.05
Quantile SVM cost 1 gamma 0.1	5.38	4.76	5.07
Quantile SVM cost 100 gamma 0.01	5.38	4.84	5.11
Quantile RT se 1.5	5.53	4.72	5.13
Quantile SVM cost 50 gamma 0.01	5.36	4.97	5.16
Nmodels SVM cost 100 gamma 0.01	5.67	4.66	5.17
Nmodels SVM cost 1 gamma 0.1	5.63	4.73	5.18
Quantile SVM cost 1 gamma 0.05	5.43	4.97	5.2
Quantile SVM cost 10 gamma 0.01	5.3	5.14	5.22
Nmodels SVM cost 50 gamma 0.01	5.71	4.76	5.23
Quantile SVM cost 5 gamma 0.01	5.39	5.19	5.29
Nmodels SVM cost 1 gamma 0.05	5.79	4.86	5.33

Nmodels SVM cost 10 gamma 0.01	5.81	4.91	5.36
Nmodels SVM cost 5 gamma 0.01	5.92	5.07	5.49
Quantile SVM cost 100 gamma 0.001	5.59	5.68	5.64
Quantile SVM cost 1 gamma 0.01	5.78	5.69	5.73
Quantile SVM cost 50 gamma 0.001	5.72	5.82	5.77
Nmodels SVM cost 100 gamma 0.001	6.21	5.42	5.82
Nmodels SVM cost 50 gamma 0.001	6.34	5.47	5.9
Nmodels SVM cost 1 gamma 0.01	6.41	5.48	5.94
Quantile SVM cost 10 gamma 0.001	5.96	6.12	6.04
Nmodels SVM cost 10 gamma 0.001	6.71	5.67	6.19
Quantile SVM cost 5 gamma 0.001	6.17	6.28	6.23
Iterated SVM cost 50 gamma 0.001	6.65	5.82	6.23
Iterated SVM cost 100 gamma 0.001	6.64	5.94	6.29
Iterated SVM cost 10 gamma 0.001	6.85	5.96	6.41
Nmodels SVM cost 5 gamma 0.001	6.96	5.88	6.42
Iterated SVM cost 5 gamma 0.001	6.98	6.03	6.5
Quantile SVM cost 1 gamma 0.001	6.89	6.7	6.79
Iterated SVM cost 5 gamma 0.01	7.33	6.42	6.87
Iterated SVM cost 10 gamma 0.01	7.28	6.57	6.93
Iterated RT se 1.5	7.42	6.47	6.94
Iterated RT se 1	7.44	6.47	6.96
Iterated SVM cost 1 gamma 0.001	7.65	6.34	6.99
Nmodels SVM cost 1 gamma 0.001	7.61	6.4	7.01
Iterated RT se 0	7.42	6.6	7.01
Iterated RT se 0.5	7.48	6.59	7.03
Iterated SVM cost 1 gamma 0.01	7.38	6.79	7.09
Iterated SVM cost 50 gamma 0.01	7.41	6.83	7.12
Iterated SVM cost 100 gamma 0.01	7.51	6.88	7.2
Iterated QRF ntree 500	7.47	6.96	7.21
Iterated QRF ntree 1000	7.48	6.98	7.23
Iterated QRF ntree 1500	7.49	6.97	7.23
Iterated RF ntree 500	7.62	6.99	7.3
Iterated RF ntree 1000	7.62	7.01	7.31
Iterated RF ntree 1500	7.68	7.01	7.34
Iterated SVM cost 1 gamma 0.05	7.85	8.02	7.93
Iterated SVM cost 100 gamma 0.1	8.33	8.15	8.24
Iterated SVM cost 5 gamma 0.05	8.34	8.31	8.32
Iterated SVM cost 50 gamma 0.1	8.42	8.26	8.34
Iterated SVM cost 5 gamma 0.1	8.39	8.37	8.38
Iterated SVM cost 1 gamma 0.1	8.3	8.53	8.41
Iterated SVM cost 10 gamma 0.05	8.45	8.54	8.5

Iterated SVM cost 10 gamma 0.1	8.55	8.46	8.51
Iterated SVM cost 50 gamma 0.05	8.93	8.75	8.84
Iterated SVM cost 100 gamma 0.05	8.99	8.81	8.9
RW	24.21	17	20.61

Table 3.13: All setups MAQ



### 3.5.2 TQE - Total Quantile Error

Figure 3.14 shows the results using the TQE error measure for all different setups.

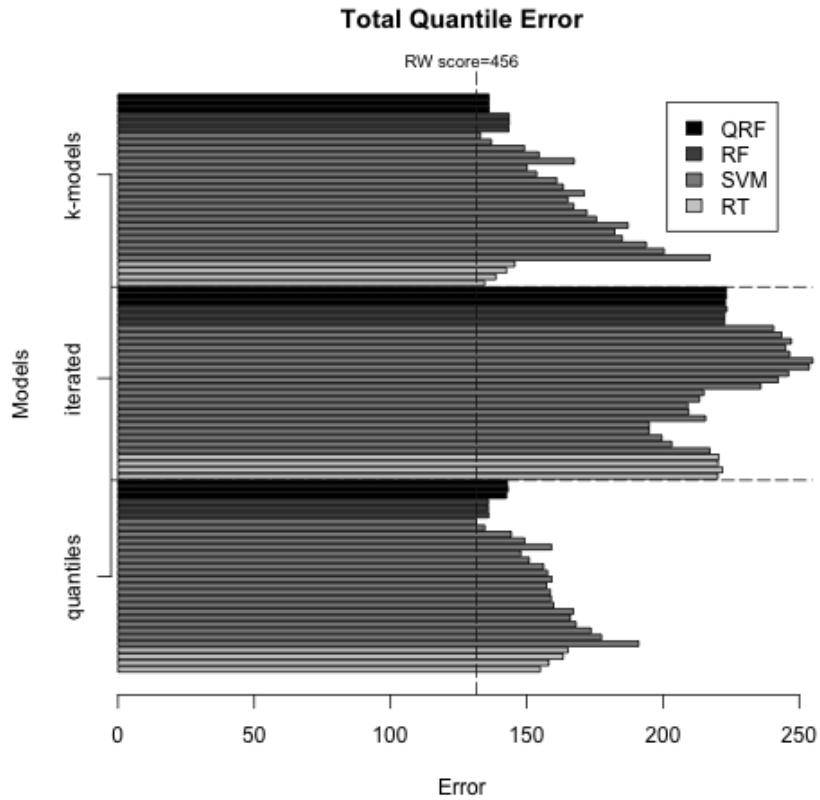


Figure 3.14: Stream 5

Table 3.14 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile SVM cost 100 gamma 0.1	65.32	66.17	131.49
Nmodels SVM cost 100 gamma 0.1	65.95	67.08	133.03
Nmodels RT se 0	67.3	67.25	134.54
Quantile SVM cost 50 gamma 0.1	66.77	67.84	134.61
Quantile RF ntree 1000	70.48	65.4	135.88
Quantile RF ntree 1500	70.5	65.42	135.92
Quantile RF ntree 500	70.6	65.44	136.03

Nmodels QRF ntree 500	68.05	68.09	136.14
Nmodels QRF ntree 1000	68.01	68.14	136.15
Nmodels QRF ntree 1500	68	68.18	136.18
Nmodels SVM cost 50 gamma 0.1	68.29	68.76	137.05
Nmodels RT se 0.5	70.17	68.47	138.64
Nmodels RT se 1	73.18	69.38	142.56
Quantile QRF ntree 500	71.17	71.39	142.56
Quantile QRF ntree 1500	71.9	71	142.9
Quantile QRF ntree 1000	71.64	71.49	143.13
Nmodels RF ntree 500	76.26	67.15	143.41
Nmodels RF ntree 1500	76.36	67.16	143.52
Nmodels RF ntree 1000	76.38	67.16	143.53
Quantile SVM cost 10 gamma 0.1	72.53	71.83	144.36
Nmodels RT se 1.5	75.43	70.17	145.6
Quantile SVM cost 100 gamma 0.05	73.89	73.92	147.81
Nmodels SVM cost 10 gamma 0.1	75.11	74.05	149.16
Quantile SVM cost 5 gamma 0.1	75.15	74.08	149.23
Nmodels SVM cost 100 gamma 0.05	75.46	74.67	150.13
Quantile SVM cost 50 gamma 0.05	75.76	75.13	150.89
Nmodels SVM cost 50 gamma 0.05	77.21	76.45	153.66
Nmodels SVM cost 5 gamma 0.1	78.09	76.4	154.49
Quantile RT se 0	80.99	73.99	154.98
Quantile SVM cost 10 gamma 0.05	78.77	77.42	156.2
Quantile SVM cost 100 gamma 0.01	80.23	77.03	157.26
Quantile SVM cost 5 gamma 0.05	79.72	77.91	157.63
Quantile RT se 0.5	82.69	75.38	158.07
Quantile SVM cost 50 gamma 0.01	81.04	77.6	158.64
Quantile SVM cost 10 gamma 0.01	81.18	77.81	158.99
Quantile SVM cost 1 gamma 0.1	81.31	77.81	159.12
Quantile SVM cost 1 gamma 0.05	81.76	77.51	159.26
Quantile SVM cost 5 gamma 0.01	81.75	78.15	159.9
Nmodels SVM cost 10 gamma 0.05	81.75	79.23	160.99
Quantile RT se 1	86.38	76.98	163.36
Nmodels SVM cost 5 gamma 0.05	83.99	79.41	163.4
Nmodels SVM cost 100 gamma 0.01	87.16	77.87	165.03
Quantile RT se 1.5	87.03	78.13	165.16
Quantile SVM cost 100 gamma 0.001	83.4	82.59	165.99
Quantile SVM cost 1 gamma 0.01	85.32	81.77	167.09
Nmodels SVM cost 50 gamma 0.01	89.02	78.2	167.22
Nmodels SVM cost 1 gamma 0.1	87.04	80.36	167.4
Quantile SVM cost 50 gamma 0.001	84.4	83.69	168.09

Nmodels SVM cost 1 gamma 0.05	91.04	80.04	171.08
Nmodels SVM cost 10 gamma 0.01	92.53	79.54	172.07
Quantile SVM cost 10 gamma 0.001	87.24	86.32	173.56
Nmodels SVM cost 5 gamma 0.01	94.19	81.39	175.58
Quantile SVM cost 5 gamma 0.001	89.93	87.49	177.42
Nmodels SVM cost 100 gamma 0.001	96.38	85.87	182.25
Nmodels SVM cost 50 gamma 0.001	98.34	86.69	185.03
Nmodels SVM cost 1 gamma 0.01	101.17	85.97	187.14
Quantile SVM cost 1 gamma 0.001	98.76	92.3	191.07
Nmodels SVM cost 10 gamma 0.001	104.15	89.71	193.86
Iterated SVM cost 50 gamma 0.001	101.07	93.86	194.93
Iterated SVM cost 100 gamma 0.001	100.51	94.47	194.97
Iterated SVM cost 10 gamma 0.001	104.19	95.37	199.56
Nmodels SVM cost 5 gamma 0.001	108.39	92.02	200.41
Iterated SVM cost 5 gamma 0.001	107.54	95.64	203.18
Iterated SVM cost 10 gamma 0.01	107.6	101.51	209.11
Iterated SVM cost 5 gamma 0.01	109.38	100	209.38
Iterated SVM cost 50 gamma 0.01	109.99	103.37	213.36
Iterated SVM cost 100 gamma 0.01	111.03	103.96	214.99
Iterated SVM cost 1 gamma 0.01	111.44	104.17	215.61
Iterated SVM cost 1 gamma 0.001	120.29	96.91	217.21
Nmodels SVM cost 1 gamma 0.001	118.38	98.84	217.22
Iterated RT se 0	116.92	103.21	220.12
Iterated RT se 1	116.55	103.66	220.2
Iterated RT se 1.5	116.33	104.11	220.44
Iterated RT se 0.5	117.15	104.74	221.89
Iterated RF ntree 500	117.05	105.53	222.59
Iterated RF ntree 1000	116.77	105.85	222.62
Iterated QRF ntree 500	115.13	107.75	222.88
Iterated QRF ntree 1500	115.64	107.59	223.23
Iterated QRF ntree 1000	115.64	107.6	223.24
Iterated RF ntree 1500	117.45	105.98	223.43
Iterated SVM cost 1 gamma 0.05	117.41	118.45	235.87
Iterated SVM cost 100 gamma 0.1	120.04	120.57	240.61
Iterated SVM cost 5 gamma 0.05	123.23	119	242.23
Iterated SVM cost 50 gamma 0.1	121.39	122.13	243.52
Iterated SVM cost 5 gamma 0.1	123.31	121.66	244.97
Iterated SVM cost 10 gamma 0.05	124.68	121.39	246.07
Iterated SVM cost 1 gamma 0.1	123.04	123.47	246.51
Iterated SVM cost 10 gamma 0.1	123.43	123.66	247.08
Iterated SVM cost 50 gamma 0.05	129.12	124.52	253.64

Iterated SVM cost 100 gamma 0.05	130.05	124.87	254.93
RW	227.31	229.06	456.36

Table 3.14: All setups TQE

### 3.5.3 Utility

Figure 3.15 shows the results using the Utility error measure (larger is better) for all different setups.

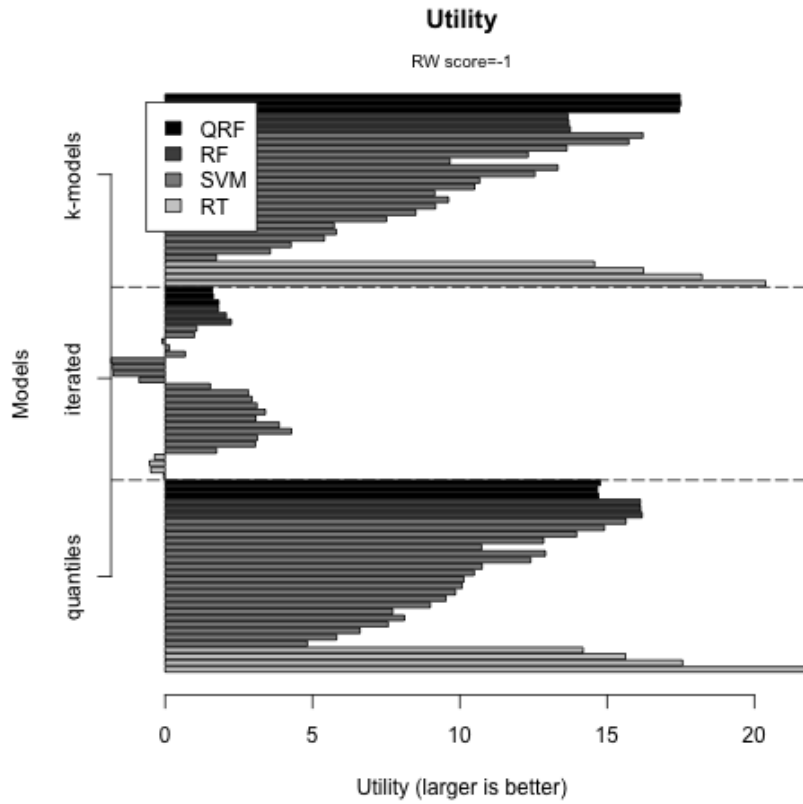


Figure 3.15: Stream 5

Table 3.15 shows all setups order by the Utility.

	utility
Quantile RT se 0	21.98
Nmodels RT se 0	20.38
Nmodels RT se 0.5	18.22
Quantile RT se 0.5	17.56
Nmodels QRF ntree 1000	17.5
Nmodels QRF ntree 1500	17.48
Nmodels QRF ntree 500	17.45

Nmodels RT se 1	16.24
Nmodels SVM cost 100 gamma 0.1	16.21
Quantile RF ntree 500	16.19
Quantile RF ntree 1000	16.14
Quantile RF ntree 1500	16.13
Nmodels SVM cost 50 gamma 0.1	15.73
Quantile SVM cost 100 gamma 0.1	15.64
Quantile RT se 1	15.63
Quantile SVM cost 50 gamma 0.1	14.91
Quantile QRF ntree 1500	14.77
Quantile QRF ntree 500	14.72
Quantile QRF ntree 1000	14.67
Nmodels RT se 1.5	14.57
Quantile RT se 1.5	14.19
Quantile SVM cost 10 gamma 0.1	13.96
Nmodels RF ntree 500	13.75
Nmodels RF ntree 1000	13.7
Nmodels RF ntree 1500	13.67
Nmodels SVM cost 10 gamma 0.1	13.63
Nmodels SVM cost 100 gamma 0.05	13.33
Quantile SVM cost 100 gamma 0.05	12.91
Quantile SVM cost 5 gamma 0.1	12.85
Nmodels SVM cost 50 gamma 0.05	12.55
Quantile SVM cost 50 gamma 0.05	12.41
Nmodels SVM cost 5 gamma 0.1	12.32
Quantile SVM cost 10 gamma 0.05	10.76
Quantile SVM cost 1 gamma 0.1	10.74
Nmodels SVM cost 10 gamma 0.05	10.68
Nmodels SVM cost 5 gamma 0.05	10.51
Quantile SVM cost 5 gamma 0.05	10.49
Quantile SVM cost 1 gamma 0.05	10.14
Quantile SVM cost 100 gamma 0.01	10.08
Quantile SVM cost 50 gamma 0.01	9.85
Nmodels SVM cost 1 gamma 0.1	9.67
Nmodels SVM cost 100 gamma 0.01	9.62
Quantile SVM cost 10 gamma 0.01	9.53
Nmodels SVM cost 50 gamma 0.01	9.18
Nmodels SVM cost 1 gamma 0.05	9.15
Quantile SVM cost 5 gamma 0.01	9
Nmodels SVM cost 10 gamma 0.01	8.5
Quantile SVM cost 100 gamma 0.001	8.12

Quantile SVM cost 1 gamma 0.01	7.72
Quantile SVM cost 50 gamma 0.001	7.57
Nmodels SVM cost 5 gamma 0.01	7.51
Quantile SVM cost 10 gamma 0.001	6.61
Quantile SVM cost 5 gamma 0.001	5.82
Nmodels SVM cost 100 gamma 0.001	5.81
Nmodels SVM cost 1 gamma 0.01	5.74
Nmodels SVM cost 50 gamma 0.001	5.41
Quantile SVM cost 1 gamma 0.001	4.83
Iterated SVM cost 50 gamma 0.001	4.29
Nmodels SVM cost 10 gamma 0.001	4.27
Iterated SVM cost 100 gamma 0.001	3.87
Nmodels SVM cost 5 gamma 0.001	3.57
Iterated SVM cost 5 gamma 0.01	3.4
Iterated SVM cost 10 gamma 0.001	3.13
Iterated SVM cost 10 gamma 0.01	3.11
Iterated SVM cost 1 gamma 0.01	3.08
Iterated SVM cost 5 gamma 0.001	3.06
Iterated SVM cost 50 gamma 0.01	2.95
Iterated SVM cost 100 gamma 0.01	2.83
Iterated RF ntree 500	2.25
Iterated RF ntree 1000	2.07
Iterated QRF ntree 500	1.82
Iterated RF ntree 1500	1.81
Iterated SVM cost 1 gamma 0.001	1.74
Nmodels SVM cost 1 gamma 0.001	1.74
Iterated QRF ntree 1000	1.64
Iterated QRF ntree 1500	1.61
Iterated SVM cost 1 gamma 0.05	1.53
Iterated SVM cost 100 gamma 0.1	1.07
Iterated SVM cost 50 gamma 0.1	0.99
Iterated SVM cost 1 gamma 0.1	0.68
Iterated SVM cost 5 gamma 0.1	0.14
Iterated RT se 0	-0.05
Iterated SVM cost 10 gamma 0.1	-0.1
Iterated RT se 1.5	-0.35
Iterated RT se 0.5	-0.49
Iterated RT se 1	-0.53
Iterated SVM cost 5 gamma 0.05	-0.88
RW	-1.1
Iterated SVM cost 10 gamma 0.05	-1.76

Iterated SVM cost 50 gamma 0.05	-1.79
Iterated SVM cost 100 gamma 0.05	-1.84

Table 3.15: All setups Utility



## 3.6 Stream 6

### 3.6.1 MAQ - Mean Absolute Quantile Deviation

Figure 3.16 shows the results using the MAQ error measure for all different setups.

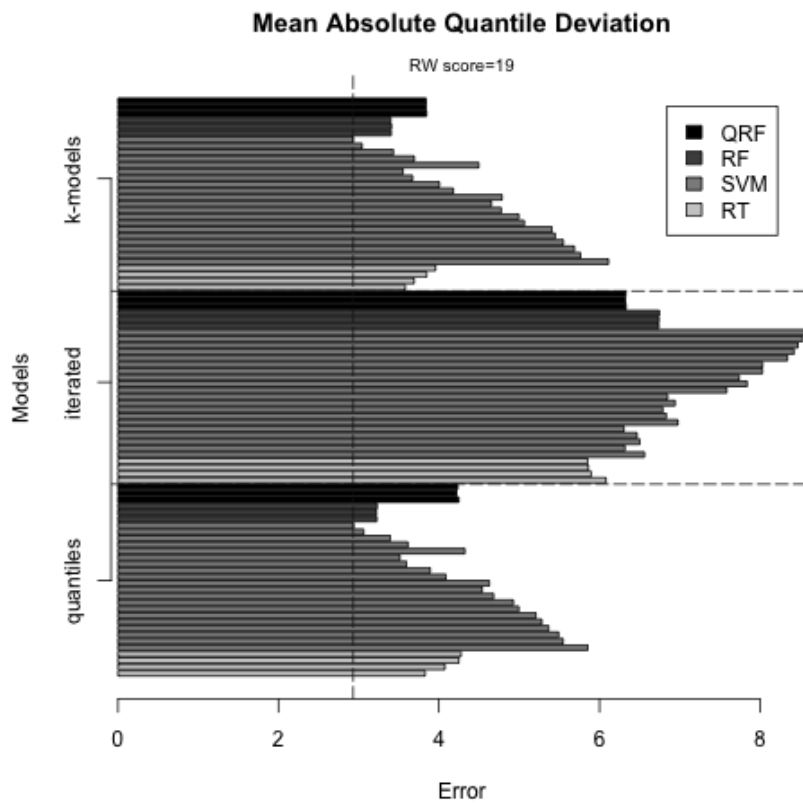


Figure 3.16: Stream 6

Table 3.16 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Nmodels SVM cost 100 gamma 0.1	2.86	3	2.93
Quantile SVM cost 100 gamma 0.1	2.75	3.12	2.94
Nmodels SVM cost 50 gamma 0.1	3.01	3.08	3.04
Quantile SVM cost 50 gamma 0.1	2.89	3.23	3.06
Quantile RF ntree 1000	3.21	3.23	3.22

Quantile RF ntree 500	3.22	3.23	3.23
Quantile RF ntree 1500	3.22	3.23	3.23
Quantile SVM cost 10 gamma 0.1	3.33	3.46	3.39
Nmodels RF ntree 1500	3.53	3.27	3.4
Nmodels RF ntree 500	3.54	3.27	3.4
Nmodels RF ntree 1000	3.54	3.28	3.41
Nmodels SVM cost 10 gamma 0.1	3.44	3.42	3.43
Quantile SVM cost 100 gamma 0.05	3.43	3.59	3.51
Nmodels SVM cost 100 gamma 0.05	3.48	3.62	3.55
Nmodels RT se 0	3.61	3.55	3.58
Quantile SVM cost 50 gamma 0.05	3.53	3.66	3.6
Quantile SVM cost 5 gamma 0.1	3.55	3.67	3.61
Nmodels SVM cost 50 gamma 0.05	3.62	3.73	3.67
Nmodels RT se 0.5	3.71	3.67	3.69
Nmodels SVM cost 5 gamma 0.1	3.73	3.66	3.69
Quantile RT se 0	3.86	3.79	3.83
Nmodels QRF ntree 1500	3.76	3.92	3.84
Nmodels QRF ntree 1000	3.77	3.92	3.84
Nmodels QRF ntree 500	3.76	3.93	3.84
Nmodels RT se 1	3.89	3.8	3.85
Quantile SVM cost 10 gamma 0.05	3.87	3.92	3.89
Nmodels RT se 1.5	4	3.91	3.96
Nmodels SVM cost 10 gamma 0.05	4.02	4	4.01
Quantile RT se 0.5	4.11	4.04	4.07
Quantile SVM cost 5 gamma 0.05	4.06	4.11	4.09
Nmodels SVM cost 5 gamma 0.05	4.19	4.17	4.18
Quantile QRF ntree 1000	4.18	4.26	4.22
Quantile QRF ntree 1500	4.18	4.29	4.23
Quantile QRF ntree 500	4.2	4.3	4.25
Quantile RT se 1	4.16	4.33	4.25
Quantile RT se 1.5	4.16	4.39	4.28
Quantile SVM cost 1 gamma 0.1	4.32	4.33	4.32
Nmodels SVM cost 1 gamma 0.1	4.49	4.5	4.5
Quantile SVM cost 100 gamma 0.01	4.45	4.63	4.54
Quantile SVM cost 1 gamma 0.05	4.63	4.63	4.63
Nmodels SVM cost 100 gamma 0.01	4.77	4.54	4.65
Quantile SVM cost 50 gamma 0.01	4.61	4.75	4.68
Nmodels SVM cost 50 gamma 0.01	4.86	4.69	4.78
Nmodels SVM cost 1 gamma 0.05	4.86	4.72	4.79
Quantile SVM cost 10 gamma 0.01	4.87	4.98	4.93
Nmodels SVM cost 10 gamma 0.01	5.03	4.95	4.99

Quantile SVM cost 5 gamma 0.01	4.95	5.04	4.99
Nmodels SVM cost 5 gamma 0.01	5.08	5.05	5.06
Quantile SVM cost 1 gamma 0.01	5.13	5.28	5.21
Quantile SVM cost 100 gamma 0.001	5.04	5.52	5.28
Quantile SVM cost 50 gamma 0.001	5.12	5.61	5.37
Nmodels SVM cost 1 gamma 0.01	5.43	5.38	5.41
Nmodels SVM cost 100 gamma 0.001	5.32	5.58	5.45
Quantile SVM cost 10 gamma 0.001	5.28	5.7	5.49
Quantile SVM cost 5 gamma 0.001	5.34	5.75	5.55
Nmodels SVM cost 50 gamma 0.001	5.39	5.71	5.55
Nmodels SVM cost 10 gamma 0.001	5.55	5.83	5.69
Nmodels SVM cost 5 gamma 0.001	5.66	5.87	5.76
Iterated RT se 1.5	5.53	6.18	5.85
Quantile SVM cost 1 gamma 0.001	5.74	5.97	5.85
Iterated RT se 1	5.5	6.22	5.86
Iterated RT se 0.5	5.5	6.29	5.9
Iterated RT se 0	5.61	6.55	6.08
Nmodels SVM cost 1 gamma 0.001	6.22	6	6.11
Iterated SVM cost 100 gamma 0.001	6.4	6.21	6.31
Iterated SVM cost 5 gamma 0.001	6.5	6.13	6.32
Iterated QRF ntree 1000	5.97	6.67	6.32
Iterated QRF ntree 1500	5.97	6.69	6.33
Iterated QRF ntree 500	5.99	6.67	6.33
Iterated SVM cost 50 gamma 0.001	6.65	6.29	6.47
Iterated SVM cost 10 gamma 0.001	6.71	6.29	6.5
Iterated SVM cost 1 gamma 0.001	6.59	6.53	6.56
Iterated RF ntree 500	6.47	7.01	6.74
Iterated RF ntree 1000	6.46	7.02	6.74
Iterated RF ntree 1500	6.49	7	6.75
Iterated SVM cost 10 gamma 0.01	6.82	6.76	6.79
Iterated SVM cost 5 gamma 0.01	6.74	6.92	6.83
Iterated SVM cost 100 gamma 0.01	6.76	6.93	6.85
Iterated SVM cost 50 gamma 0.01	6.84	7.04	6.94
Iterated SVM cost 1 gamma 0.01	6.84	7.12	6.98
Iterated SVM cost 1 gamma 0.05	7.31	7.85	7.58
Iterated SVM cost 10 gamma 0.05	7.66	7.82	7.74
Iterated SVM cost 5 gamma 0.05	7.63	8.04	7.84
Iterated SVM cost 50 gamma 0.05	7.7	8.36	8.03
Iterated SVM cost 100 gamma 0.05	7.64	8.43	8.03
Iterated SVM cost 1 gamma 0.1	8.14	8.54	8.34
Iterated SVM cost 5 gamma 0.1	8.29	8.56	8.42

Iterated SVM cost 10 gamma 0.1	8.32	8.63	8.47
Iterated SVM cost 50 gamma 0.1	8.34	8.73	8.53
Iterated SVM cost 100 gamma 0.1	8.44	8.87	8.66
RW	17.92	19.46	18.69

Table 3.16: All setups MAQ

### 3.6.2 TQE - Total Quantile Error

Figure 3.17 shows the results using the TQE error measure for all different setups.

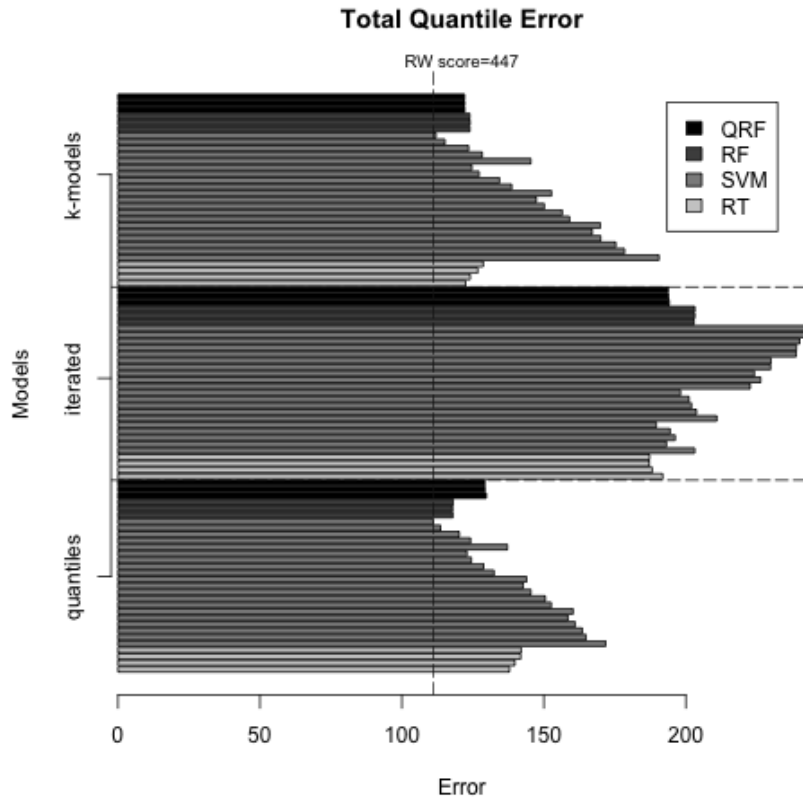


Figure 3.17: Stream 6

Table 3.17 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Quantile SVM cost 100 gamma 0.1	52.28	58.7	110.98
Nmodels SVM cost 100 gamma 0.1	54.27	57.72	111.99
Quantile SVM cost 50 gamma 0.1	53.53	60.08	113.62
Nmodels SVM cost 50 gamma 0.1	55.93	59.23	115.16
Quantile RF ntree 1000	58.18	59.66	117.84
Quantile RF ntree 500	58.29	59.64	117.93
Quantile RF ntree 1500	58.34	59.71	118.05

Quantile SVM cost 10 gamma 0.1	57.35	62.84	120.2
Nmodels QRF ntree 1500	59.75	62.31	122.06
Nmodels QRF ntree 1000	59.79	62.33	122.11
Nmodels QRF ntree 500	59.79	62.32	122.11
Nmodels RT se 0	60.74	61.68	122.42
Quantile SVM cost 100 gamma 0.05	58.84	64.03	122.86
Nmodels SVM cost 10 gamma 0.1	59.99	63.49	123.48
Nmodels RF ntree 1500	62.49	61.4	123.89
Nmodels RF ntree 500	62.49	61.41	123.9
Nmodels RF ntree 1000	62.49	61.48	123.97
Nmodels RT se 0.5	62.01	62.03	124.04
Quantile SVM cost 5 gamma 0.1	59.44	64.73	124.16
Quantile SVM cost 50 gamma 0.05	59.63	64.81	124.44
Nmodels SVM cost 100 gamma 0.05	60.28	64.38	124.66
Nmodels RT se 1	63.74	62.96	126.7
Nmodels SVM cost 50 gamma 0.05	61.43	65.75	127.18
Nmodels SVM cost 5 gamma 0.1	62.67	65.59	128.27
Nmodels RT se 1.5	64.69	63.93	128.62
Quantile SVM cost 10 gamma 0.05	62.37	66.39	128.75
Quantile QRF ntree 1500	63.61	65.58	129.19
Quantile QRF ntree 1000	63.76	65.47	129.23
Quantile QRF ntree 500	63.82	65.9	129.72
Quantile SVM cost 5 gamma 0.05	64.53	67.89	132.42
Nmodels SVM cost 10 gamma 0.05	66.21	68.15	134.36
Quantile SVM cost 1 gamma 0.1	67.19	69.95	137.14
Quantile RT se 0	68.85	69.04	137.89
Nmodels SVM cost 5 gamma 0.05	68.75	69.9	138.65
Quantile RT se 0.5	70.42	69.35	139.77
Quantile RT se 1	70.43	71.42	141.85
Quantile RT se 1.5	70.47	71.49	141.97
Quantile SVM cost 100 gamma 0.01	69.44	73.3	142.74
Quantile SVM cost 1 gamma 0.05	71.84	72.05	143.9
Nmodels SVM cost 1 gamma 0.1	71.78	73.6	145.38
Quantile SVM cost 50 gamma 0.01	71.54	73.86	145.4
Nmodels SVM cost 100 gamma 0.01	74.39	72.95	147.34
Nmodels SVM cost 50 gamma 0.01	75.79	74.34	150.13
Quantile SVM cost 10 gamma 0.01	75.7	74.81	150.51
Quantile SVM cost 5 gamma 0.01	77.24	75.34	152.58
Nmodels SVM cost 1 gamma 0.05	76.97	75.7	152.67
Nmodels SVM cost 10 gamma 0.01	79.51	76.94	156.45
Quantile SVM cost 100 gamma 0.001	79.52	78.9	158.43

Nmodels SVM cost 5 gamma 0.01	80.98	78.05	159.03
Quantile SVM cost 1 gamma 0.01	81.57	78.69	160.26
Quantile SVM cost 50 gamma 0.001	81.29	79.68	160.97
Quantile SVM cost 10 gamma 0.001	84.18	79.32	163.49
Quantile SVM cost 5 gamma 0.001	85.01	79.78	164.79
Nmodels SVM cost 100 gamma 0.001	85.28	81.73	167.01
Nmodels SVM cost 1 gamma 0.01	86.58	83.25	169.84
Nmodels SVM cost 50 gamma 0.001	86.98	82.99	169.97
Quantile SVM cost 1 gamma 0.001	88.49	83.24	171.73
Nmodels SVM cost 10 gamma 0.001	90.68	84.63	175.31
Nmodels SVM cost 5 gamma 0.001	92.65	85.76	178.41
Iterated RT se 1	87.85	99.25	187.1
Iterated RT se 1.5	88.35	98.87	187.22
Iterated RT se 0.5	87.97	100.16	188.13
Iterated SVM cost 100 gamma 0.001	94.15	95.41	189.56
Nmodels SVM cost 1 gamma 0.001	100.58	89.95	190.53
Iterated RT se 0	90.79	101.04	191.83
Iterated SVM cost 5 gamma 0.001	100.16	92.98	193.14
Iterated QRF ntree 1500	90.68	103.09	193.77
Iterated QRF ntree 1000	90.6	103.24	193.84
Iterated QRF ntree 500	90.47	103.66	194.12
Iterated SVM cost 50 gamma 0.001	97.75	96.68	194.43
Iterated SVM cost 10 gamma 0.001	102.11	94.13	196.24
Iterated SVM cost 100 gamma 0.01	94.74	103.37	198.1
Iterated SVM cost 50 gamma 0.01	97.4	103.69	201.1
Iterated SVM cost 10 gamma 0.01	99.63	102.34	201.97
Iterated RF ntree 500	97.41	105.46	202.87
Iterated SVM cost 1 gamma 0.001	101.54	101.57	203.12
Iterated RF ntree 1000	97.23	105.91	203.14
Iterated RF ntree 1500	97.5	105.65	203.15
Iterated SVM cost 5 gamma 0.01	98.98	104.74	203.72
Iterated SVM cost 1 gamma 0.01	100.81	110.07	210.88
Iterated SVM cost 1 gamma 0.05	104.05	118.61	222.66
Iterated SVM cost 10 gamma 0.05	108.99	115.11	224.1
Iterated SVM cost 5 gamma 0.05	107.81	118.51	226.32
Iterated SVM cost 50 gamma 0.05	109.26	120.56	229.82
Iterated SVM cost 100 gamma 0.05	109.91	120.06	229.97
Iterated SVM cost 1 gamma 0.1	112.08	126.72	238.8
Iterated SVM cost 5 gamma 0.1	112.48	126.43	238.91
Iterated SVM cost 10 gamma 0.1	112.2	127.85	240.04
Iterated SVM cost 50 gamma 0.1	114.77	127.73	242.5

Iterated SVM cost 100 gamma 0.1	115.99	128.67	244.66
RW	195.76	251.61	447.37

Table 3.17: All setups TQE



### 3.6.3 Utility

Figure 3.18 shows the results using the Utility error measure (larger is better) for all different setups.

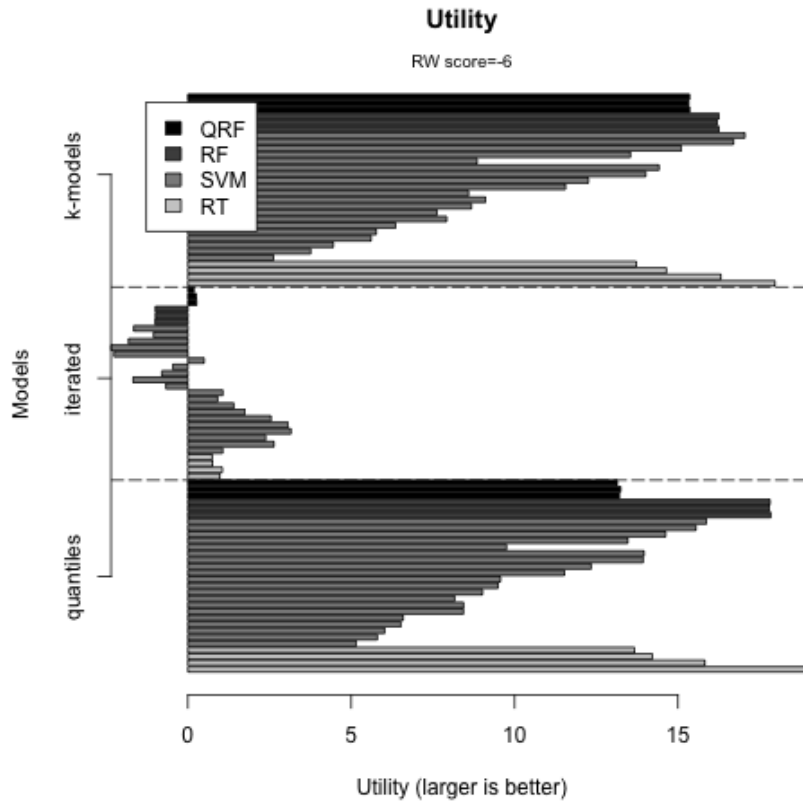


Figure 3.18: Stream 6

Table 3.18 shows all setups order by the Utility.

	utility
Quantile RT se 0	19.12
Nmodels RT se 0	17.97
Quantile RF ntree 500	17.84
Quantile RF ntree 1500	17.81
Quantile RF ntree 1000	17.79
Nmodels SVM cost 100 gamma 0.1	17.05
Nmodels SVM cost 50 gamma 0.1	16.7

Nmodels RT se 0.5	16.31
Nmodels RF ntree 1500	16.25
Nmodels RF ntree 500	16.25
Nmodels RF ntree 1000	16.19
Quantile SVM cost 100 gamma 0.1	15.87
Quantile RT se 0.5	15.82
Quantile SVM cost 50 gamma 0.1	15.55
Nmodels QRF ntree 500	15.35
Nmodels QRF ntree 1500	15.35
Nmodels QRF ntree 1000	15.33
Nmodels SVM cost 10 gamma 0.1	15.1
Nmodels RT se 1	14.65
Quantile SVM cost 10 gamma 0.1	14.62
Nmodels SVM cost 100 gamma 0.05	14.42
Quantile RT se 1	14.21
Nmodels SVM cost 50 gamma 0.05	14.01
Quantile SVM cost 100 gamma 0.05	13.96
Quantile SVM cost 50 gamma 0.05	13.93
Nmodels RT se 1.5	13.72
Quantile RT se 1.5	13.67
Nmodels SVM cost 5 gamma 0.1	13.54
Quantile SVM cost 5 gamma 0.1	13.46
Quantile QRF ntree 1000	13.25
Quantile QRF ntree 500	13.2
Quantile QRF ntree 1500	13.14
Quantile SVM cost 10 gamma 0.05	12.34
Nmodels SVM cost 10 gamma 0.05	12.26
Nmodels SVM cost 5 gamma 0.05	11.56
Quantile SVM cost 5 gamma 0.05	11.53
Quantile SVM cost 1 gamma 0.1	9.75
Quantile SVM cost 1 gamma 0.05	9.57
Quantile SVM cost 100 gamma 0.01	9.49
Nmodels SVM cost 100 gamma 0.01	9.11
Quantile SVM cost 50 gamma 0.01	9.02
Nmodels SVM cost 1 gamma 0.1	8.85
Nmodels SVM cost 50 gamma 0.01	8.68
Nmodels SVM cost 1 gamma 0.05	8.59
Quantile SVM cost 5 gamma 0.01	8.44
Quantile SVM cost 1 gamma 0.01	8.43
Quantile SVM cost 10 gamma 0.01	8.16
Nmodels SVM cost 5 gamma 0.01	7.92

Nmodels SVM cost 10 gamma 0.01	7.62
Quantile SVM cost 100 gamma 0.001	6.59
Quantile SVM cost 50 gamma 0.001	6.52
Nmodels SVM cost 1 gamma 0.01	6.35
Quantile SVM cost 10 gamma 0.001	6.02
Quantile SVM cost 5 gamma 0.001	5.8
Nmodels SVM cost 100 gamma 0.001	5.76
Nmodels SVM cost 50 gamma 0.001	5.61
Quantile SVM cost 1 gamma 0.001	5.15
Nmodels SVM cost 10 gamma 0.001	4.45
Nmodels SVM cost 5 gamma 0.001	3.76
Iterated SVM cost 50 gamma 0.001	3.15
Iterated SVM cost 100 gamma 0.001	3.07
Iterated SVM cost 5 gamma 0.001	2.63
Nmodels SVM cost 1 gamma 0.001	2.62
Iterated SVM cost 1 gamma 0.01	2.54
Iterated SVM cost 10 gamma 0.001	2.38
Iterated SVM cost 5 gamma 0.01	1.75
Iterated SVM cost 10 gamma 0.01	1.4
Iterated SVM cost 100 gamma 0.01	1.07
Iterated SVM cost 1 gamma 0.001	1.06
Iterated RT se 0.5	1.05
Iterated RT se 0	0.98
Iterated SVM cost 50 gamma 0.01	0.91
Iterated RT se 1	0.75
Iterated RT se 1.5	0.75
Iterated SVM cost 100 gamma 0.05	0.5
Iterated QRF ntree 500	0.27
Iterated QRF ntree 1000	0.26
Iterated QRF ntree 1500	0.18
Iterated SVM cost 50 gamma 0.05	-0.46
Iterated SVM cost 1 gamma 0.05	-0.67
Iterated SVM cost 10 gamma 0.05	-0.8
Iterated RF ntree 1000	-0.99
Iterated RF ntree 1500	-0.99
Iterated RF ntree 500	-1
Iterated SVM cost 50 gamma 0.1	-1.05
Iterated SVM cost 100 gamma 0.1	-1.66
Iterated SVM cost 5 gamma 0.05	-1.68
Iterated SVM cost 10 gamma 0.1	-1.82
Iterated SVM cost 1 gamma 0.1	-2.26

Iterated SVM cost 5 gamma 0.1	-2.35
RW	-5.72

Table 3.18: All setups Utility

### 3.7 Stream 7

#### 3.7.1 MAQ - Mean Absolute Quantile Deviation

Figure 3.19 shows the results using the MAQ error measure for all different setups.

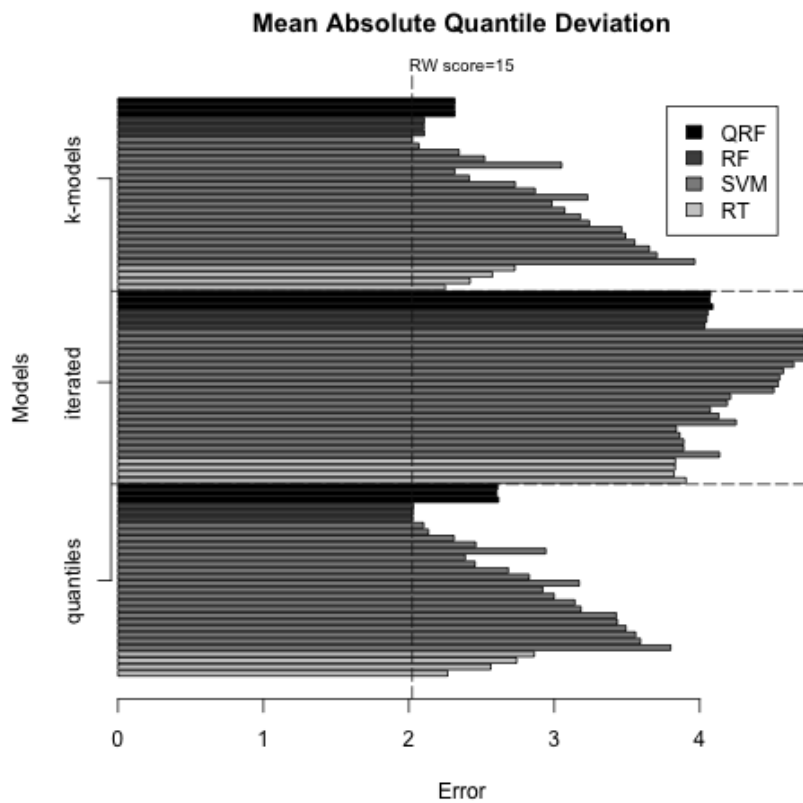


Figure 3.19: Stream 7

Table 3.19 shows all setups order by the MAQ error.

	MAQ.Q1	MAQ.Q3	MAQ
Nmodels SVM cost 100 gamma 0.1	2.06	1.99	2.02
Quantile RF ntree 500	1.88	2.17	2.03
Quantile RF ntree 1000	1.88	2.18	2.03
Quantile RF ntree 1500	1.89	2.18	2.03
Nmodels SVM cost 50 gamma 0.1	2.09	2.05	2.07

Quantile SVM cost 100 gamma 0.1	1.87	2.33	2.1
Nmodels RF ntree 1000	2.05	2.16	2.1
Nmodels RF ntree 1500	2.05	2.16	2.11
Nmodels RF ntree 500	2.05	2.17	2.11
Quantile SVM cost 50 gamma 0.1	1.9	2.37	2.13
Nmodels RT se 0	1.86	2.64	2.25
Quantile RT se 0	2.1	2.43	2.27
Quantile SVM cost 10 gamma 0.1	2.08	2.54	2.31
Nmodels QRF ntree 1000	2.07	2.56	2.31
Nmodels SVM cost 100 gamma 0.05	2.26	2.37	2.31
Nmodels QRF ntree 500	2.08	2.56	2.32
Nmodels QRF ntree 1500	2.07	2.56	2.32
Nmodels SVM cost 10 gamma 0.1	2.33	2.36	2.35
Quantile SVM cost 100 gamma 0.05	2.14	2.64	2.39
Nmodels SVM cost 50 gamma 0.05	2.3	2.53	2.42
Nmodels RT se 0.5	2.02	2.82	2.42
Quantile SVM cost 50 gamma 0.05	2.19	2.72	2.46
Quantile SVM cost 5 gamma 0.1	2.22	2.7	2.46
Nmodels SVM cost 5 gamma 0.1	2.48	2.56	2.52
Quantile RT se 0.5	2.38	2.75	2.56
Nmodels RT se 1	2.12	3.03	2.57
Quantile QRF ntree 1000	2.29	2.92	2.6
Quantile QRF ntree 1500	2.29	2.93	2.61
Quantile QRF ntree 500	2.3	2.94	2.62
Quantile SVM cost 10 gamma 0.05	2.47	2.9	2.68
Nmodels RT se 1.5	2.19	3.27	2.73
Nmodels SVM cost 10 gamma 0.05	2.51	2.95	2.73
Quantile RT se 1	2.58	2.9	2.74
Quantile SVM cost 5 gamma 0.05	2.6	3.05	2.83
Quantile RT se 1.5	2.71	3.01	2.86
Nmodels SVM cost 5 gamma 0.05	2.65	3.08	2.87
Quantile SVM cost 100 gamma 0.01	2.72	3.12	2.92
Quantile SVM cost 1 gamma 0.1	2.73	3.15	2.94
Nmodels SVM cost 100 gamma 0.01	2.74	3.23	2.98
Quantile SVM cost 50 gamma 0.01	2.81	3.19	3
Nmodels SVM cost 1 gamma 0.1	2.95	3.15	3.05
Nmodels SVM cost 50 gamma 0.01	2.84	3.3	3.07
Quantile SVM cost 10 gamma 0.01	2.95	3.33	3.14
Quantile SVM cost 1 gamma 0.05	2.94	3.4	3.17
Nmodels SVM cost 10 gamma 0.01	3.1	3.26	3.18
Quantile SVM cost 5 gamma 0.01	3	3.37	3.18

Nmodels SVM cost 1 gamma 0.05	3.09	3.37	3.23
Nmodels SVM cost 5 gamma 0.01	3.24	3.24	3.24
Quantile SVM cost 1 gamma 0.01	3.26	3.6	3.43
Quantile SVM cost 100 gamma 0.001	3.36	3.5	3.43
Nmodels SVM cost 1 gamma 0.01	3.63	3.29	3.46
Nmodels SVM cost 100 gamma 0.001	3.61	3.37	3.49
Quantile SVM cost 50 gamma 0.001	3.44	3.55	3.49
Nmodels SVM cost 50 gamma 0.001	3.69	3.42	3.55
Quantile SVM cost 10 gamma 0.001	3.48	3.64	3.56
Quantile SVM cost 5 gamma 0.001	3.48	3.71	3.59
Nmodels SVM cost 10 gamma 0.001	3.81	3.5	3.65
Nmodels SVM cost 5 gamma 0.001	3.88	3.54	3.71
Quantile SVM cost 1 gamma 0.001	3.64	3.96	3.8
Iterated RT se 0.5	3.65	3.99	3.82
Iterated RT se 1	3.64	4.02	3.83
Iterated RT se 1.5	3.64	4.02	3.83
Iterated SVM cost 100 gamma 0.001	3.76	3.92	3.84
Iterated SVM cost 50 gamma 0.001	3.84	3.89	3.86
Iterated SVM cost 5 gamma 0.001	4	3.78	3.89
Iterated SVM cost 10 gamma 0.001	4.01	3.77	3.89
Iterated RT se 0	3.72	4.09	3.91
Nmodels SVM cost 1 gamma 0.001	4.28	3.65	3.97
Iterated RF ntree 500	3.76	4.31	4.03
Iterated RF ntree 1000	3.79	4.31	4.05
Iterated RF ntree 1500	3.8	4.31	4.06
Iterated QRF ntree 1000	3.85	4.28	4.07
Iterated SVM cost 10 gamma 0.01	4.03	4.11	4.07
Iterated QRF ntree 1500	3.86	4.29	4.08
Iterated QRF ntree 500	3.87	4.31	4.09
Iterated SVM cost 5 gamma 0.01	4.11	4.15	4.13
Iterated SVM cost 1 gamma 0.001	4.29	3.98	4.14
Iterated SVM cost 50 gamma 0.01	4.12	4.26	4.19
Iterated SVM cost 100 gamma 0.01	4.07	4.36	4.21
Iterated SVM cost 1 gamma 0.01	4.27	4.23	4.25
Iterated SVM cost 1 gamma 0.05	4.06	4.96	4.51
Iterated SVM cost 5 gamma 0.05	4.16	4.92	4.54
Iterated SVM cost 10 gamma 0.05	4.21	4.89	4.55
Iterated SVM cost 50 gamma 0.05	4.32	4.83	4.57
Iterated SVM cost 100 gamma 0.05	4.42	4.87	4.65
Iterated SVM cost 50 gamma 0.1	4.36	5.08	4.72
Iterated SVM cost 1 gamma 0.1	4.24	5.21	4.72

Iterated SVM cost 100 gamma 0.1	4.39	5.08	4.74
Iterated SVM cost 10 gamma 0.1	4.39	5.1	4.74
Iterated SVM cost 5 gamma 0.1	4.36	5.19	4.78
RW	12.23	18.14	15.19

Table 3.19: All setups MAQ



### 3.7.2 TQE - Total Quantile Error

Figure 3.20 shows the results using the TQE error measure for all different setups.

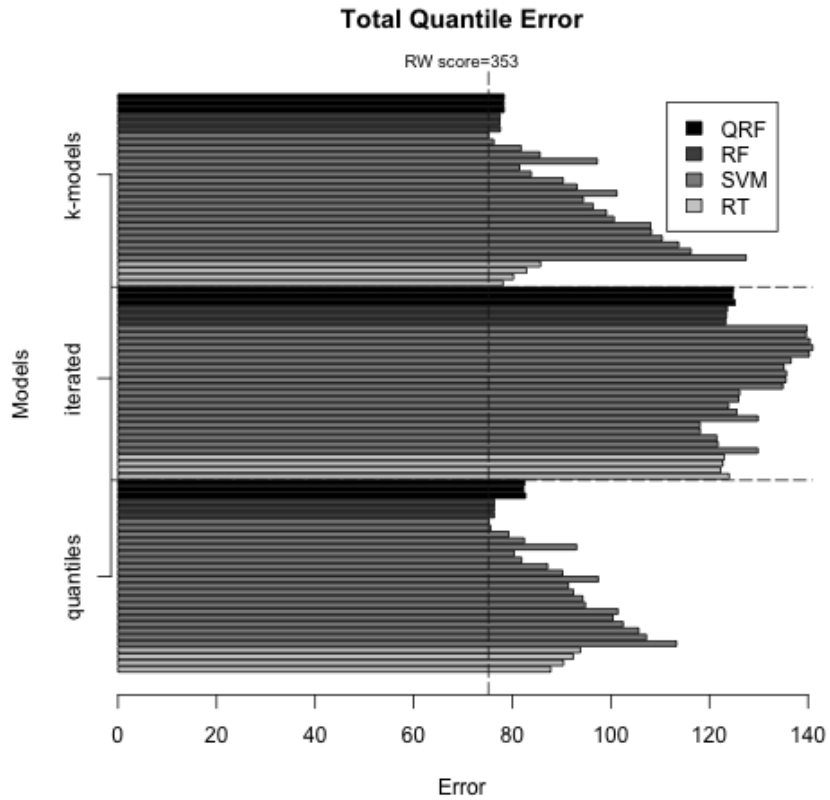


Figure 3.20: Stream 7

Table 3.20 shows all setups order by the TQE error.

	QTE.Q1	QTE.Q3	QTE
Nmodels SVM cost 100 gamma 0.1	38.16	37.02	75.17
Quantile SVM cost 100 gamma 0.1	35.83	39.45	75.28
Quantile SVM cost 50 gamma 0.1	36.11	39.48	75.6
Nmodels SVM cost 50 gamma 0.1	38.76	37.48	76.24
Quantile RF ntree 1000	37.8	38.52	76.32
Quantile RF ntree 500	37.85	38.47	76.33
Quantile RF ntree 1500	37.88	38.52	76.4

Nmodels RF ntree 1000	38.93	38.54	77.47
Nmodels RF ntree 1500	38.98	38.53	77.5
Nmodels RF ntree 500	38.96	38.6	77.56
Nmodels RT se 0	36.18	41.94	78.11
Nmodels QRF ntree 1000	37.75	40.55	78.3
Nmodels QRF ntree 500	37.77	40.57	78.34
Nmodels QRF ntree 1500	37.76	40.59	78.35
Quantile SVM cost 10 gamma 0.1	38.18	41.09	79.27
Nmodels RT se 0.5	36.96	43.27	80.23
Quantile SVM cost 100 gamma 0.05	38.48	41.91	80.39
Nmodels SVM cost 100 gamma 0.05	40.72	40.74	81.46
Nmodels SVM cost 10 gamma 0.1	41.63	40.16	81.78
Quantile SVM cost 50 gamma 0.05	39.22	42.66	81.88
Quantile QRF ntree 1000	39.37	42.96	82.32
Quantile SVM cost 5 gamma 0.1	39.79	42.64	82.43
Quantile QRF ntree 1500	39.45	43.04	82.5
Quantile QRF ntree 500	39.55	43.16	82.71
Nmodels RT se 1	37.86	45.03	82.89
Nmodels SVM cost 50 gamma 0.05	41.62	42.22	83.84
Nmodels SVM cost 5 gamma 0.1	43.4	42.21	85.61
Nmodels RT se 1.5	38.66	47.06	85.73
Quantile SVM cost 10 gamma 0.05	42.57	44.58	87.15
Quantile RT se 0	45.05	42.76	87.81
Quantile SVM cost 5 gamma 0.05	44.26	45.96	90.22
Nmodels SVM cost 10 gamma 0.05	44.58	45.73	90.31
Quantile RT se 0.5	46	44.39	90.39
Quantile SVM cost 100 gamma 0.01	46.1	45.25	91.35
Quantile RT se 1	47.03	45.33	92.36
Quantile SVM cost 50 gamma 0.01	46.71	45.7	92.41
Quantile SVM cost 1 gamma 0.1	45.89	47.16	93.05
Nmodels SVM cost 5 gamma 0.05	46.25	46.88	93.12
Quantile RT se 1.5	47.96	45.85	93.81
Quantile SVM cost 10 gamma 0.01	47.58	46.71	94.29
Nmodels SVM cost 100 gamma 0.01	47.32	47.08	94.4
Quantile SVM cost 5 gamma 0.01	47.65	47.17	94.82
Nmodels SVM cost 50 gamma 0.01	48.62	47.82	96.43
Nmodels SVM cost 1 gamma 0.1	49.3	47.94	97.24
Quantile SVM cost 1 gamma 0.05	48.38	49.06	97.44
Nmodels SVM cost 10 gamma 0.01	51.32	47.79	99.11
Quantile SVM cost 100 gamma 0.001	51.83	48.59	100.42
Nmodels SVM cost 5 gamma 0.01	52.98	47.67	100.65

Nmodels SVM cost 1 gamma 0.05	51.39	49.81	101.2
Quantile SVM cost 1 gamma 0.01	51.83	49.59	101.42
Quantile SVM cost 50 gamma 0.001	53.28	49.21	102.49
Quantile SVM cost 10 gamma 0.001	55.67	49.98	105.65
Quantile SVM cost 5 gamma 0.001	56.78	50.43	107.21
Nmodels SVM cost 1 gamma 0.01	59.09	48.99	108.09
Nmodels SVM cost 100 gamma 0.001	58.65	49.58	108.23
Nmodels SVM cost 50 gamma 0.001	60.27	50.13	110.39
Quantile SVM cost 1 gamma 0.001	61.01	52.31	113.32
Nmodels SVM cost 10 gamma 0.001	63.24	50.51	113.75
Nmodels SVM cost 5 gamma 0.001	65.28	50.97	116.25
Iterated SVM cost 100 gamma 0.001	60.48	57.62	118.1
Iterated SVM cost 50 gamma 0.001	61.03	57.09	118.12
Iterated SVM cost 10 gamma 0.001	64.81	56.66	121.48
Iterated SVM cost 5 gamma 0.001	65.52	56.21	121.73
Iterated RT se 0.5	59.68	62.58	122.25
Iterated RT se 1	59.91	62.8	122.7
Iterated RT se 1.5	60.02	62.99	123.01
Iterated RF ntree 500	59.54	63.75	123.29
Iterated RF ntree 1000	59.93	63.51	123.45
Iterated RF ntree 1500	60.01	63.6	123.6
Iterated SVM cost 10 gamma 0.01	63.31	60.59	123.89
Iterated RT se 0	60.57	63.42	123.99
Iterated QRF ntree 1000	59.63	65.1	124.73
Iterated QRF ntree 1500	59.44	65.43	124.86
Iterated QRF ntree 500	59.83	65.39	125.23
Iterated SVM cost 5 gamma 0.01	65.19	60.37	125.56
Iterated SVM cost 50 gamma 0.01	63.65	62.27	125.92
Iterated SVM cost 100 gamma 0.01	63.83	62.3	126.13
Nmodels SVM cost 1 gamma 0.001	74.05	53.37	127.42
Iterated SVM cost 1 gamma 0.001	72.1	57.72	129.82
Iterated SVM cost 1 gamma 0.01	68.12	61.71	129.83
Iterated SVM cost 1 gamma 0.05	64.97	69.92	134.89
Iterated SVM cost 50 gamma 0.05	67.56	67.52	135.08
Iterated SVM cost 5 gamma 0.05	66.24	69.27	135.51
Iterated SVM cost 10 gamma 0.05	66.59	69.04	135.62
Iterated SVM cost 100 gamma 0.05	68.63	67.92	136.54
Iterated SVM cost 50 gamma 0.1	69.84	69.8	139.63
Iterated SVM cost 100 gamma 0.1	70.22	69.54	139.76
Iterated SVM cost 1 gamma 0.1	68.37	71.87	140.24
Iterated SVM cost 10 gamma 0.1	69.66	70.69	140.35

Iterated SVM cost 5 gamma 0.1	69.06	71.88	140.94
RW	156.11	196.77	352.88

Table 3.20: All setups TQE

### 3.7.3 Utility

Figure 3.21 shows the results using the Utility error measure (larger is better) for all different setups.

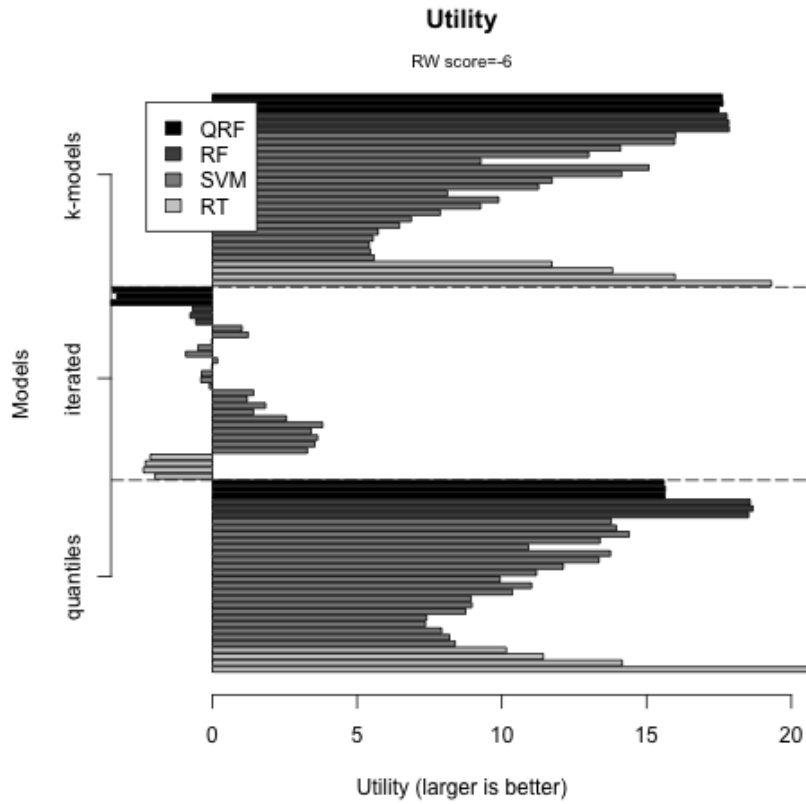


Figure 3.21: Stream 7

Table 3.21 shows all setups order by the Utility.

	utility
Quantile RT se 0	20.74
Nmodels RT se 0	19.31
Quantile RF ntree 1000	18.67
Quantile RF ntree 1500	18.58
Quantile RF ntree 500	18.52
Nmodels RF ntree 500	17.85
Nmodels RF ntree 1000	17.84

Nmodels RF ntree 1500	17.77
Nmodels QRF ntree 1000	17.64
Nmodels QRF ntree 1500	17.61
Nmodels QRF ntree 500	17.49
Nmodels SVM cost 100 gamma 0.1	16
Nmodels RT se 0.5	15.98
Nmodels SVM cost 50 gamma 0.1	15.97
Quantile QRF ntree 1000	15.65
Quantile QRF ntree 500	15.63
Quantile QRF ntree 1500	15.6
Nmodels SVM cost 100 gamma 0.05	15.08
Quantile SVM cost 10 gamma 0.1	14.39
Quantile RT se 0.5	14.16
Nmodels SVM cost 50 gamma 0.05	14.14
Nmodels SVM cost 10 gamma 0.1	14.1
Quantile SVM cost 50 gamma 0.1	13.95
Nmodels RT se 1	13.82
Quantile SVM cost 100 gamma 0.1	13.78
Quantile SVM cost 100 gamma 0.05	13.75
Quantile SVM cost 5 gamma 0.1	13.39
Quantile SVM cost 50 gamma 0.05	13.36
Nmodels SVM cost 5 gamma 0.1	13
Quantile SVM cost 10 gamma 0.05	12.12
Nmodels SVM cost 10 gamma 0.05	11.73
Nmodels RT se 1.5	11.73
Quantile RT se 1	11.43
Nmodels SVM cost 5 gamma 0.05	11.27
Quantile SVM cost 5 gamma 0.05	11.2
Quantile SVM cost 100 gamma 0.01	11.03
Quantile SVM cost 1 gamma 0.1	10.92
Quantile SVM cost 50 gamma 0.01	10.37
Quantile RT se 1.5	10.16
Quantile SVM cost 1 gamma 0.05	9.94
Nmodels SVM cost 100 gamma 0.01	9.89
Nmodels SVM cost 1 gamma 0.1	9.28
Nmodels SVM cost 50 gamma 0.01	9.27
Quantile SVM cost 5 gamma 0.01	8.97
Quantile SVM cost 10 gamma 0.01	8.93
Quantile SVM cost 1 gamma 0.01	8.75
Quantile SVM cost 1 gamma 0.001	8.39
Quantile SVM cost 5 gamma 0.001	8.19

Nmodels SVM cost 1 gamma 0.05	8.12
Quantile SVM cost 10 gamma 0.001	7.92
Nmodels SVM cost 10 gamma 0.01	7.87
Quantile SVM cost 100 gamma 0.001	7.4
Quantile SVM cost 50 gamma 0.001	7.36
Nmodels SVM cost 5 gamma 0.01	6.87
Nmodels SVM cost 1 gamma 0.01	6.46
Nmodels SVM cost 100 gamma 0.001	5.73
Nmodels SVM cost 1 gamma 0.001	5.59
Nmodels SVM cost 50 gamma 0.001	5.55
Nmodels SVM cost 5 gamma 0.001	5.46
Nmodels SVM cost 10 gamma 0.001	5.42
Iterated SVM cost 100 gamma 0.001	3.81
Iterated SVM cost 10 gamma 0.001	3.64
Iterated SVM cost 5 gamma 0.001	3.54
Iterated SVM cost 50 gamma 0.001	3.41
Iterated SVM cost 1 gamma 0.001	3.28
Iterated SVM cost 1 gamma 0.01	2.56
Iterated SVM cost 10 gamma 0.01	1.84
Iterated SVM cost 100 gamma 0.01	1.42
Iterated SVM cost 5 gamma 0.01	1.42
Iterated SVM cost 50 gamma 0.1	1.23
Iterated SVM cost 50 gamma 0.01	1.2
Iterated SVM cost 100 gamma 0.1	1.02
Iterated SVM cost 100 gamma 0.05	0.18
Iterated SVM cost 50 gamma 0.05	-0.01
Iterated SVM cost 10 gamma 0.1	-0.02
Iterated SVM cost 1 gamma 0.05	-0.1
Iterated SVM cost 10 gamma 0.05	-0.37
Iterated SVM cost 5 gamma 0.05	-0.39
Iterated SVM cost 5 gamma 0.1	-0.5
Iterated RF ntree 500	-0.57
Iterated RF ntree 1500	-0.68
Iterated RF ntree 1000	-0.77
Iterated SVM cost 1 gamma 0.1	-0.92
Iterated RT se 0	-1.98
Iterated RT se 1.5	-2.14
Iterated RT se 1	-2.31
Iterated RT se 0.5	-2.38
Iterated QRF ntree 1000	-3.3
Iterated QRF ntree 1500	-3.44

Iterated QRF ntree 500	-3.5
RW	-5.82

Table 3.21: All setups Utility