Table 1: Model 1

Estimator	IMSE	IMSE | $Y<q_{.25}$	IMSE | $q_{.25}<Y<q_{.5}$	IMSE | $q_{.5}<Y<q_{.75}$	IMSE | $q_{.75}<Y$
(12) $\hat{f}_{\hat{\mu},\text{nonpar}}$	0.086 (1)	0.059 (1)	0.0054 (1)	0.0081 (1)	0.014 (1)
(13) $\hat{f}_{\mu,\xi}$	0.068 (0.78)	0.054 (0.91)	0.0043 (0.8)	0.0042 (0.51)	0.0054 (0.39)
(14) $\hat{f}_{\mu,\hat{\xi}}$	0.069 (0.79)	0.054 (0.92)	0.0047 (0.87)	0.0042 (0.51)	0.0054 (0.4)
(15) $\hat{f}_{\hat{\mu},\text{par}}$	0.094 (1.1)	0.068 (1.1)	0.0047 (0.87)	0.0038 (0.46)	0.018 (1.3)
(20) $f^{\dagger}_{\hat{\mu},\text{nonpar}}$	0.081 (0.93)	0.058 (0.98)	0.0046 (0.85)	0.0066 (0.81)	0.012 (0.84)
(21) $f^{\dagger}_{\mu,\xi}$	0.07 (0.8)	0.058 (0.99)	0.0029 (0.53)	0.0034 (0.41)	0.0049 (0.35)
(22) $f^{\dagger}_{\mu,\hat{\xi}}$	0.07 (0.81)	0.059 (0.99)	0.0032 (0.59)	0.0034 (0.41)	0.005 (0.36)
(23) $f^{\dagger}_{\hat{\mu},\text{par}}$	0.1 (1.2)	0.075 (1.3)	0.0063 (1.2)	0.0046 (0.56)	0.017 (1.2)
(25) $f^{\dagger}_{\hat{\omega},\text{nonpar}}$	0.32 (3.6)	0.19 (3.2)	0.034 (6.2)	0.049 (6)	0.043 (3.1)
(26) $f^{\dagger}_{\hat{\omega},\text{par}}$	0.1 (1.2)	0.076 (1.3)	0.0062 (1.2)	0.0044 (0.55)	0.016 (1.1)
(4) p	0.06 (0.69)	0.04 (0.67)	0.011 (2)	0.0038 (0.46)	0.0055 (0.4)
f	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
(hat25) $\hat{f}_{\hat{\omega},\text{nonpar}}$	0.36 (4.2)	0.2 (3.4)	0.037 (6.9)	0.055 (6.8)	0.068 (4.9)
(hat26) $\hat{f}_{\hat{\omega},\text{par}}$	0.094 (1.1)	0.069 (1.2)	0.0046 (0.86)	0.0037 (0.46)	0.017 (1.2)
$\hat{\mu}$, nonpar	0.02 (0.23)	7.9e-07 (1.3e-05)	1e-05 (0.0019)	7.7e-05 (0.0095)	0.02 (1.4)
μ, ξ	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
$\mu, \hat{\xi}$	2e-04 (0.0023)	3.1e-08 (5.2e-07)	3.8e-07 (7.1e-05)	2.5e-06 (0.00031)	0.00019 (0.014)
$\hat{\mu}$, par	0.003 (0.035)	2.1e-05 (0.00036)	2.6e-05 (0.0048)	4.2e-05 (0.0052)	0.0029 (0.21)
$\hat{\omega}$, nonpar	0.02 (0.24)	4.5e-05 (0.00076)	0.00016 (0.03)	0.00041 (0.05)	0.02 (1.4)
$\hat{\omega}$, par	0.003 (0.035)	2.4e-05 (4e-04)	3e-05 (0.0055)	5e-05 (0.0061)	0.0029 (0.21)

Table 2: Model 2

Estimator	IMSE	IMSE $\mid Y<q_{.25}$	IMSE $\mid q_{.25}<Y<q_{.5}$	IMSE $\mid q_{.5}<Y<q_{.75}$	IMSE $\mid q_{.75}<Y$
(12) $\hat{f}_{\hat{\mu},\text{nonpar}}$	0.0023 (1)	0.0019 (1)	0.00023 (1)	7.4e-05 (1)	0.00015 (1)
(13) $\hat{f}_{\mu,\xi}$	0.0033 (1.4)	0.0029 (1.5)	0.00022 (0.93)	0.00013 (1.8)	5.7e-05 (0.38)
(14) $\hat{f}_{\mu,\hat{\xi}}$	0.0097 (4.1)	0.0069 (3.7)	0.00084 (3.6)	0.00053 (7.2)	0.0014 (9.5)
(15) $\hat{f}_{\hat{\mu},\text{par}}$	0.0065 (2.8)	0.0045 (2.4)	0.00037 (1.6)	0.0012 (17)	0.00036 (2.4)
(20) $f^{\dagger}_{\hat{\mu},\text{nonpar}}$	0.0037 (1.6)	0.0032 (1.7)	0.00016 (0.68)	0.00011 (1.5)	0.00022 (1.5)
(21) $f^{\dagger}_{\mu,\xi}$	0.00088 (0.37)	0.00048 (0.25)	0.00021 (0.9)	0.00013 (1.8)	5.6e-05 (0.37)
(22) $f^{\dagger}_{\mu,\hat{\xi}}$	0.012 (5)	0.0088 (4.7)	0.0011 (4.6)	0.00045 (6.1)	0.0013 (8.7)
(23) $f^{\dagger}_{\hat{\mu},\text{par}}$	0.0078 (3.3)	0.006 (3.2)	0.00035 (1.5)	0.0011 (15)	0.00034 (2.3)
(25) $f^{\dagger}_{\hat{\omega},\text{nonpar}}$	0.0015 (0.64)	0.00084 (0.45)	0.00021 (0.91)	0.00034 (4.6)	0.00011 (0.74)
(26) $f^{\dagger}_{\hat{\omega},\text{par}}$	0.0091 (3.9)	0.0065 (3.5)	0.00042 (1.8)	0.0016 (21)	0.00053 (3.5)
(4) p	0.041 (17)	0.024 (13)	0.0081 (35)	0.00078 (11)	0.0075 (50)
f	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
(hat25) $\hat{f}_{\hat{\omega},\text{nonpar}}$	0.0046 (2)	0.0039 (2.1)	3e-04 (1.3)	0.00034 (4.6)	1e-04 (0.7)
(hat26) $\hat{f}_{\hat{\omega},\text{par}}$	0.0079 (3.4)	0.0051 (2.7)	0.00045 (1.9)	0.0017 (24)	0.00054 (3.6)
$\hat{\mu}, \text{nonpar}$	0.008 (3.4)	0.0046 (2.4)	0.00082 (3.5)	0.00018 (2.5)	0.0023 (16)
μ, ξ	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
$\mu, \hat{\xi}$	0.061 (26)	0.0027 (1.4)	0.00063 (2.7)	0.00015 (2.1)	0.057 (380)
$\hat{\mu}, \text{par}$	0.14 (58)	0.00083 (0.44)	0.00036 (1.5)	0.0031 (42)	0.13 (870)
$\hat{\omega}, \text{nonpar}$	0.0046 (2)	0.00016 (0.088)	0.00017 (0.74)	0.00027 (3.7)	0.004 (27)
$\hat{\omega}, \text{par}$	2.2 (920)	0.00091 (0.48)	0.00048 (2)	0.0044 (59)	2.2 (14000)

Table 3: Model 3

Estimator	IMSE	IMSE $\mid Y<q_{.25}$	IMSE $\mid q_{.25}<Y<q_{.5}$	IMSE $\mid q_{.5}<Y<q_{.75}$	IMSE $\mid q_{.75}<Y$
$\hat{f}_{\hat{\mu},\text{nonpar}}$	0.00213 (1)	0.000524 (1)	0.000738 (1)	0.000653 (1)	0.000219 (1)
$\hat{f}_{\mu,\xi}$	0.12 (56.4)	0.0213 (40.6)	0.0408 (62.5)	0.0393 (180)	0.019 (25.8)
$\hat{f}_{\mu,\hat{\xi}}$	0.12 (56.4)	0.0213 (40.6)	0.0408 (186)	0.0393 (53.3)	0.019 (29.1)
$\hat{f}_{\hat{\mu},\text{par(rough)}}$	113 (52900)	113 (215000)	0.0243 (111)	0.0165 (25.3)	0.00301 (4.08)
$\hat{f}_{\hat{\mu},\text{par}}$	0.0291 (13.6)	0.00376 (17.1)	0.0165 (31.5)	0.00763 (10.3)	0.00125 (1.91)
$\tilde{f}_{\hat{\mu},\text{nonpar}}$	1.09 (509)	0.018 (24.4)	0.0314 (60)	0.235 (1070)	0.802 (1230)
$\tilde{f}_{\mu,\xi}$	0.0591 (27.7)	0.016 (30.6)	0.0292 (133)	0.0127 (17.1)	0.00124 (1.89)
$\tilde{f}_{\mu,\hat{\xi}}$	0.0591 (27.7)	0.016 (73.1)	0.0292 (39.5)	0.0127 (19.4)	0.00124 (2.36)
$\tilde{f}_{\hat{\mu},\text{par(rough)}}$	113 (52900)	113 (173000)	0.0243 (46.4)	0.0165 (75.4)	0.00301 (4.08)
$\tilde{f}_{\hat{\mu},\text{par}}$	0.0429 (20.1)	0.0065 (8.8)	0.0215 (33)	0.0122 (23.2)	0.00274 (12.5)
$f^{\dagger}_{\hat{\mu},\text{nonpar}}$	0.187 (87.8)	0.0198 (37.8)	0.0373 (57.2)	0.0226 (103)	0.108 (146)
$f^{\dagger}_{\mu,\xi}$	1210000 (5.69e+08)	10600 (20200000)	27200 (1.24e+08)	372000 (5.03e+08)	805000 (1.23e+09
$f^{\dagger}_{\mu,\hat{\xi}}$	1210000 (5.69e+08)	10600 (48300000)	27200 (51900000)	372000 (5.03e+08)	805000 (1.23e+09
$f^{\dagger}_{\hat{\mu},\text{par(rough)}}$	161 (75200)	139 (266000)	2.68 (12200)	8.28 (11200)	10.1 (15400)
$f^{\dagger}_{\hat{\mu},\text{par}}$	0.0227 (10.6)	0.00146 (2.79)	0.00727 (33.2)	0.00674 (10.3)	0.00721 (9.77)
$f^{\dagger}_{\hat{\omega},\text{nonpar}}$	0.211 (98.9)	0.0193 (88.1)	0.0364 (49.3)	0.0206 (39.3)	0.135 (206)
$f^{\dagger}_{\hat{\omega},\text{par}}$	0.0236 (11)	0.00129 (1.75)	0.00721 (13.8)	0.00712 (32.5)	0.00795 (12.2)
p	0.0591 (27.7)	0.016 (30.6)	0.0292 (133)	0.0127 (17.1)	0.00124 (1.89)
$\hat{f}_{\hat{\omega},\text{nonpar}}$	0.126 (58.9)	0.0216 (41.2)	0.0415 (189)	0.0414 (56.1)	0.0213 (32.6)
$\hat{f}_{\hat{\omega},\text{par}}$	0.0285 (13.4)	0.00381 (17.4)	0.0162 (21.9)	0.00727 (13.9)	0.00126 (1.93)
$\tilde{f}_{\hat{\omega},\text{nonpar}}$	0.772 (362)	0.0174 (33.2)	0.0322 (147)	0.0207 (28.1)	0.702 (1070)
$\tilde{f}_{\hat{\omega},\text{par}}$	0.0429 (20.1)	0.00676 (12.9)	0.0216 (29.2)	0.0119 (18.3)	0.00265 (12.1)

Table 4: Model 4

Estimator	IMSE	IMSE | $Y<q_{.25}$	IMSE | $q_{.25}<Y<q_{.5}$	IMSE | $q_{.5}<Y<q_{.75}$	IMSE | $q_{.7}$
(12) $\hat{f}_{\hat{\mu},\text{nonpar}}$	0.0028 (1)	0.00046 (1)	0.00057 (1)	0.00058 (1)	0.0012 (
(13) $\hat{f}_{\mu,\xi}$	8.5e+45 (3e+48)	9.4e+44 (2e+48)	2.6e+45 (4.6e+48)	2.9e+45 (5e+48)	2.1e+45 (1.7
(14) $\hat{f}_{\mu,\hat{\xi}}$	3.1e+46 (1.1e+49)	2.7e+45 (5.8e+48)	8.8e+45 (1.5e+49)	1.1e+46 (1.8e+49)	8.9e+45 (7.4
(15) $\hat{f}_{\hat{\mu},\text{par}}$	0.0032 (1.2)	0.00049 (1.1)	0.00068 (1.2)	0.00053 (0.91)	0.0016 (1
(20) $f^{\dagger}_{\hat{\mu},\text{nonpar}}$	0.003 (1.1)	0.00068 (1.5)	0.00052 (0.92)	0.00067 (1.2)	0.0011 (0.
(21) $f^{\dagger}_{\mu,\xi}$	0.0026 (0.94)	0.00043 (0.93)	0.00054 (0.94)	0.00055 (0.95)	0.0011 (0.
(22) $f^{\dagger}_{\mu,\hat{\xi}}$	0.0027 (0.96)	0.00046 (1)	0.00054 (0.95)	0.00056 (0.96)	0.0012 (0.
(23) $f^{\dagger}_{\hat{\mu},\text{par}}$	0.0027 (0.96)	0.00046 (1)	0.00054 (0.95)	0.00056 (0.97)	0.0012 (0.
(25) $f^{\dagger}_{\hat{\omega},\text{nonpar}}$	0.003 (1.1)	7e-04 (1.5)	0.00051 (0.89)	0.00065 (1.1)	0.0011 (0.
(26) $f^{\dagger}_{\hat{\omega},\text{par}}$	0.0027 (0.96)	0.00046 (1)	0.00054 (0.95)	0.00056 (0.96)	0.0012 (0.
(4) p	0.016 (5.8)	0.008 (17)	0.00077 (1.4)	0.0035 (6.2)	0.004 (3.
f	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
(hat25) $\hat{f}_{\hat{\omega},\text{nonpar}}$	0.0027 (0.96)	0.00047 (1)	0.00054 (0.94)	0.00054 (0.95)	0.0012 (0.
(hat26) $\hat{f}_{\hat{\omega},\text{par}}$	0.0032 (1.1)	0.00048 (1)	0.00067 (1.2)	0.00052 (0.91)	0.0015 (1
$\hat{\mu}$, nonpar	0.00043 (0.15)	0.00041 (0.89)	2.1e-06 (0.0037)	2e-06 (0.0035)	9.8e-06 (0.0
μ, ξ	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
$\mu, \hat{\xi}$	0.0012 (0.43)	0.0012 (2.5)	3e-05 (0.053)	1.4e-05 (0.024)	1.1e-05 (0.0
$\hat{\mu}$, par	0.00017 (0.06)	0.00017 (0.36)	7.4e-07 (0.0013)	3.1e-07 (0.00054)	3.1e-07 (0.0
$\hat{\omega}$, nonpar	0.0012 (0.42)	0.0012 (2.5)	4e-06 (0.007)	8.1e-07 (0.0014)	6.3e-06 (0.0
$\hat{\omega}$, par	0.00016 (0.056)	0.00016 (0.34)	7.7e-07 (0.0013)	3.2e-07 (0.00055)	3.1e-07 (0.0

Table 5: Model 5

Estimator	IMSE	IMSE | $Y<q_{.25}$	IMSE | $q_{.25}<Y<q_{.5}$	IMSE | $q_{.5}<Y<q_{.75}$	IMSE | $q_{.75}<Y$
(12) $\hat{f}_{\hat{\mu},\text{nonpar}}$	0.0011 (1)	0.00012 (1)	2e-04 (1)	0.00023 (1)	0.00052 (1)
(13) $\hat{f}_{\mu,\xi}$	0.0016 (1.5)	0.00015 (1.2)	0.00027 (1.3)	9.1e-05 (0.39)	0.0011 (2.1)
(14) $\hat{f}_{\mu,\hat{\xi}}$	0.0018 (1.7)	0.00019 (1.6)	0.00029 (1.4)	9.7e-05 (0.42)	0.0012 (2.3)
(15) $\hat{f}_{\hat{\mu},\text{par}}$	0.0017 (1.6)	0.00023 (1.9)	4e-04 (1.9)	0.00014 (0.59)	0.00098 (1.9)
(20) $f^{\dagger}_{\hat{\mu},\text{nonpar}}$	0.0015 (1.4)	0.00043 (3.5)	0.00015 (0.73)	0.00041 (1.8)	0.00051 (0.99)
(21) $f^{\dagger}_{\mu,\xi}$	0.00094 (0.87)	9.8e-05 (0.81)	0.00018 (0.86)	0.00021 (0.9)	0.00045 (0.87)
(22) $f^{\dagger}_{\mu,\hat{\xi}}$	0.001 (0.96)	0.00012 (0.99)	0.00019 (0.94)	0.00021 (0.91)	0.00051 (0.98)
(23) $f^{\dagger}_{\hat{\mu},\text{par}}$	0.001 (0.94)	0.00013 (1)	0.00019 (0.91)	0.00022 (0.95)	0.00048 (0.93)
(25) $f^{\dagger}_{\hat{\omega},\text{nonpar}}$	0.0015 (1.4)	0.00046 (3.8)	0.00014 (0.69)	4e-04 (1.7)	5e-04 (0.97)
(26) $f^{\dagger}_{\hat{\omega},\text{par}}$	0.001 (0.93)	0.00012 (1)	0.00018 (0.89)	0.00022 (0.94)	0.00048 (0.92)
(4) p	0.015 (14)	0.0072 (59)	0.00052 (2.6)	0.0033 (14)	0.0037 (7.1)
f	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
(hat25) $\hat{f}_{\hat{\omega},\text{nonpar}}$	0.001 (0.96)	0.00014 (1.2)	0.00019 (0.94)	0.00022 (0.97)	0.00048 (0.92)
(hat26) $\hat{f}_{\hat{\omega},\text{par}}$	0.0017 (1.6)	0.00023 (1.9)	0.00039 (1.9)	0.00013 (0.57)	0.00097 (1.9)
$\hat{\mu}$, nonpar	0.00041 (0.38)	0.00039 (3.2)	2.7e-06 (0.013)	2.8e-06 (0.012)	1e-05 (0.02)
μ, ξ	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
$\mu, \hat{\xi}$	0.00089 (0.83)	0.00086 (7)	2.1e-05 (0.1)	9.2e-06 (0.04)	7.1e-06 (0.014)
$\hat{\mu}$, par	0.00016 (0.15)	0.00016 (1.3)	7.7e-07 (0.0038)	3.3e-07 (0.0014)	3.2e-07 (0.00061)
$\hat{\omega}$, nonpar	0.0014 (1.3)	0.0014 (12)	4.5e-06 (0.022)	8.1e-07 (0.0035)	5.4e-06 (0.01)
$\hat{\omega}$, par	0.00015 (0.14)	0.00015 (1.2)	8e-07 (0.0039)	3.3e-07 (0.0014)	3.1e-07 (6e-04)