

Robustness Check

Stock market spread (related to Table 1 in the paper)

The basic settings are the same as the ideal case except for the spread. There are 100 replications. If we set the ratio of the spread to the standard deviation of daily returns to one (i.e. the spread is much larger than in Table 1), as is typical of the stock market, the relative performance of estimators is similar. In this case, the spread is 0.0075, which is similar to the daily standard deviation of returns (like in the stock market).

	tick	15min	day
New estimator			
Estimates $\times 10^{-3}$	7.5	7.5	7.531
Relative Estimates	1	1	1.004
Est-Std $\times 10^{-3}$	0	0.00959	0.811
RMSE $\times 10^{-3}$	0	0.010	0.812
HS			
Estimates $\times 10^{-3}$	7.5	7.5	7.584
Relative Estimates	1	1	1.01
Est-Std $\times 10^{-3}$	0.000571	0.00944	0.894
RMSE $\times 10^{-3}$	0.001	0.009	0.898
Roll			
Estimates $\times 10^{-3}$	7.5	7.496	7.353
Relative Estimates	1.000	0.999	0.980
Est-Std $\times 10^{-3}$	0.0123	0.0463	1.301
RMSE $\times 10^{-3}$	0.012	0.046	1.309
CS			
Estimates $\times 10^{-3}$		7.036	7.636
Relative Estimates		0.938	1.018
Est-Std $\times 10^{-3}$		0.00505	0.345
RMSE $\times 10^{-3}$		0.464	0.371

Various k (related to Table 2 in the paper)

In the paper, $k=0.65$, here $k=0.85$

$BS_t = B(1, 0.85)$ if $\Delta M_t > 0$

$BS_t = B(1, 0.15)$ if $\Delta M_t < 0$

There are 100 replications.

	tick	15min	day
New estimator			
Estimates $\times 10^{-3}$	0.4119	0.412	0.4884
Relative Estimates	1.373	1.373	1.628
Est-Std $\times 10^{-3}$	0.000486	0.00916	0.8054
RMSE $\times 10^{-3}$	0.112	0.112	0.827
HS			
Estimates $\times 10^{-3}$	0.5234	0.5231	0.5471
Relative Estimates	1.745	1.744	1.824
Est-Std $\times 10^{-3}$	0.00052	0.0087	0.8052
RMSE $\times 10^{-3}$	0.223	0.223	0.842
Roll			
Estimates $\times 10^{-3}$	0.3963	0.3941	1.39
Relative Estimates	1.321	1.314	4.633
Est-Std $\times 10^{-3}$	0.00102	0.0229	1.851
RMSE $\times 10^{-3}$	0.096	0.097	2.148
CS			
Estimates $\times 10^{-3}$		0.0289	0.8335
Relative Estimates		0.096	2.778
Est-Std $\times 10^{-3}$		0.00509	0.3395
RMSE $\times 10^{-3}$		0.271	0.632

Various η (related to Table 3 in the paper)

In the paper $\eta=0.5$, here $\eta=0.2$

$BS_t = B(1, 0.65)$ if $\Delta M_t + 0.2\Delta M_{t-1} > 0$

$BS_t = B(1, 0.35)$ if $\Delta M_t + 0.2\Delta M_{t-1} < 0$

There are 100 replications.

	tick	15min	day
New estimator			
Estimates $\times 10^{-3}$	0.3383	0.3575	0.3485
Relative Estimates	1.128	1.192	1.162
Est-Std $\times 10^{-3}$	0.000753	0.00836	0.7464
RMSE $\times 10^{-3}$	0.038	0.058	0.748
HS			
Estimates $\times 10^{-3}$	0.3939	0.4133	0.3855
Relative Estimates	1.313	1.378	1.285
Est-Std $\times 10^{-3}$	0.000572	0.0089	0.8487
RMSE $\times 10^{-3}$	0.094	0.114	0.853
Roll			
Estimates $\times 10^{-3}$	0.3324	0.3496	1.396
Relative Estimates	1.108	1.165	4.653
Est-Std $\times 10^{-3}$	0.000976	0.0249	1.837
RMSE $\times 10^{-3}$	0.032	0.055	2.139
CS			
Estimates $\times 10^{-3}$		-0.0128	0.7902
Relative Estimates		-0.043	2.634
Est-Std $\times 10^{-3}$		0.00498	0.3404
RMSE $\times 10^{-3}$		0.313	0.597