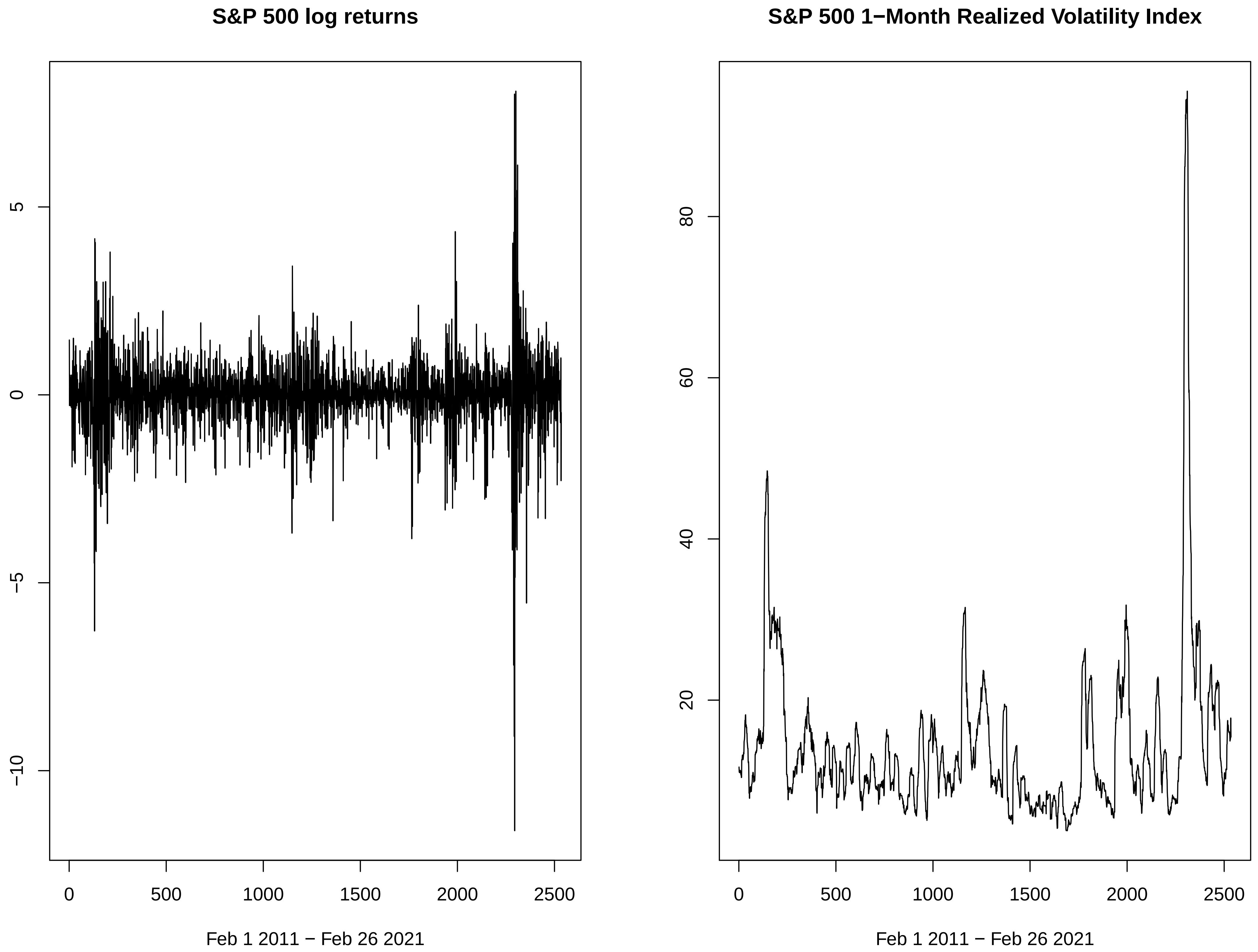
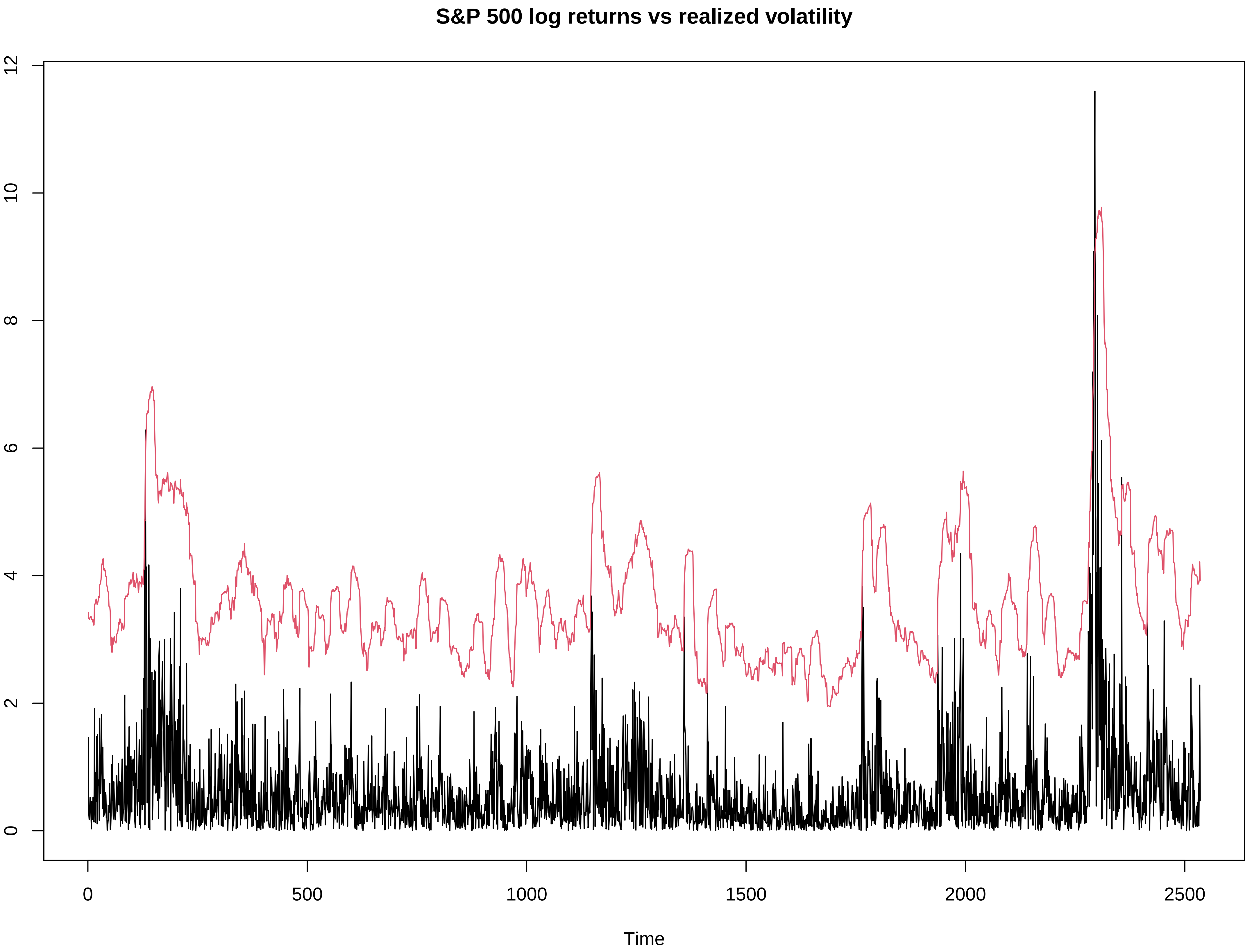
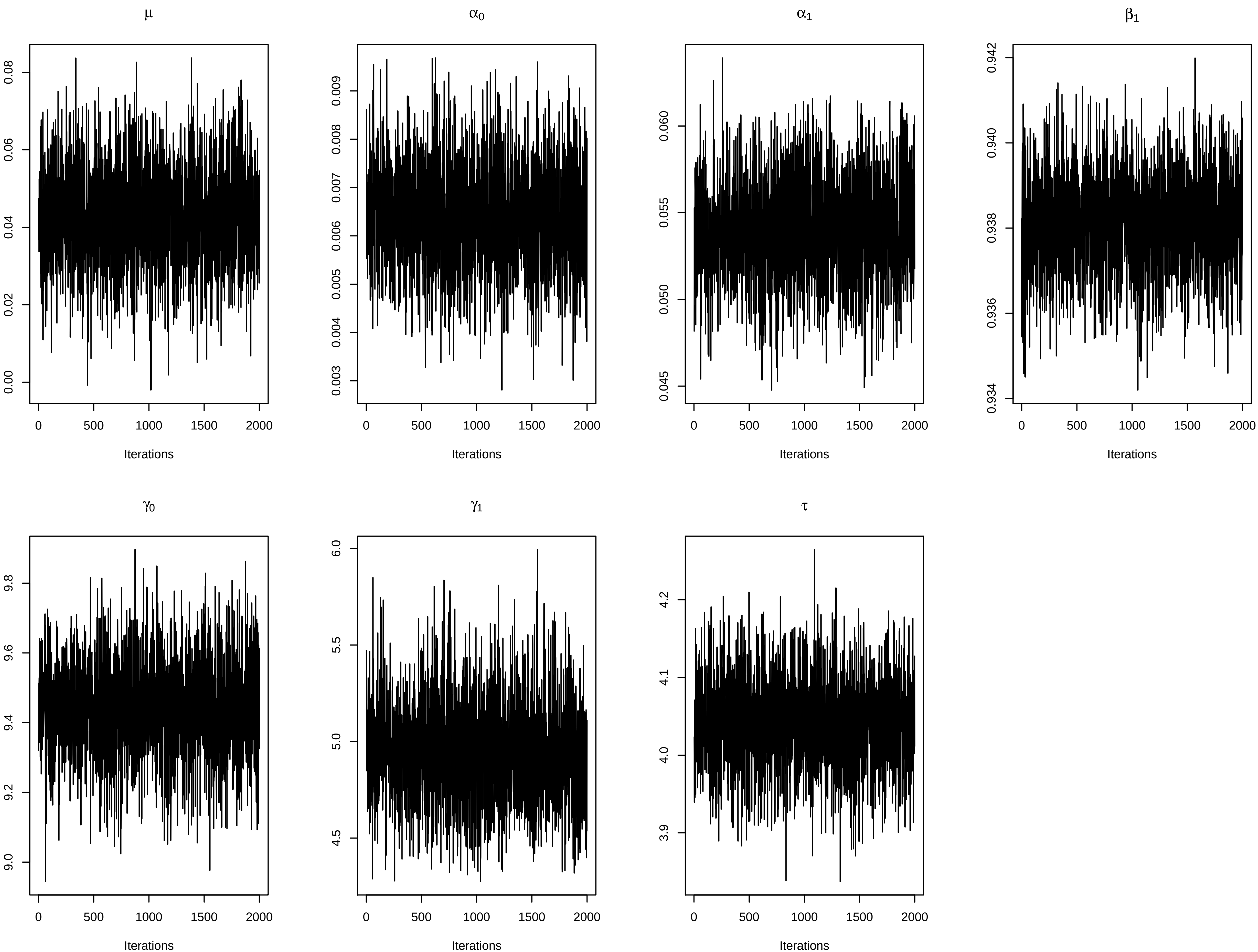
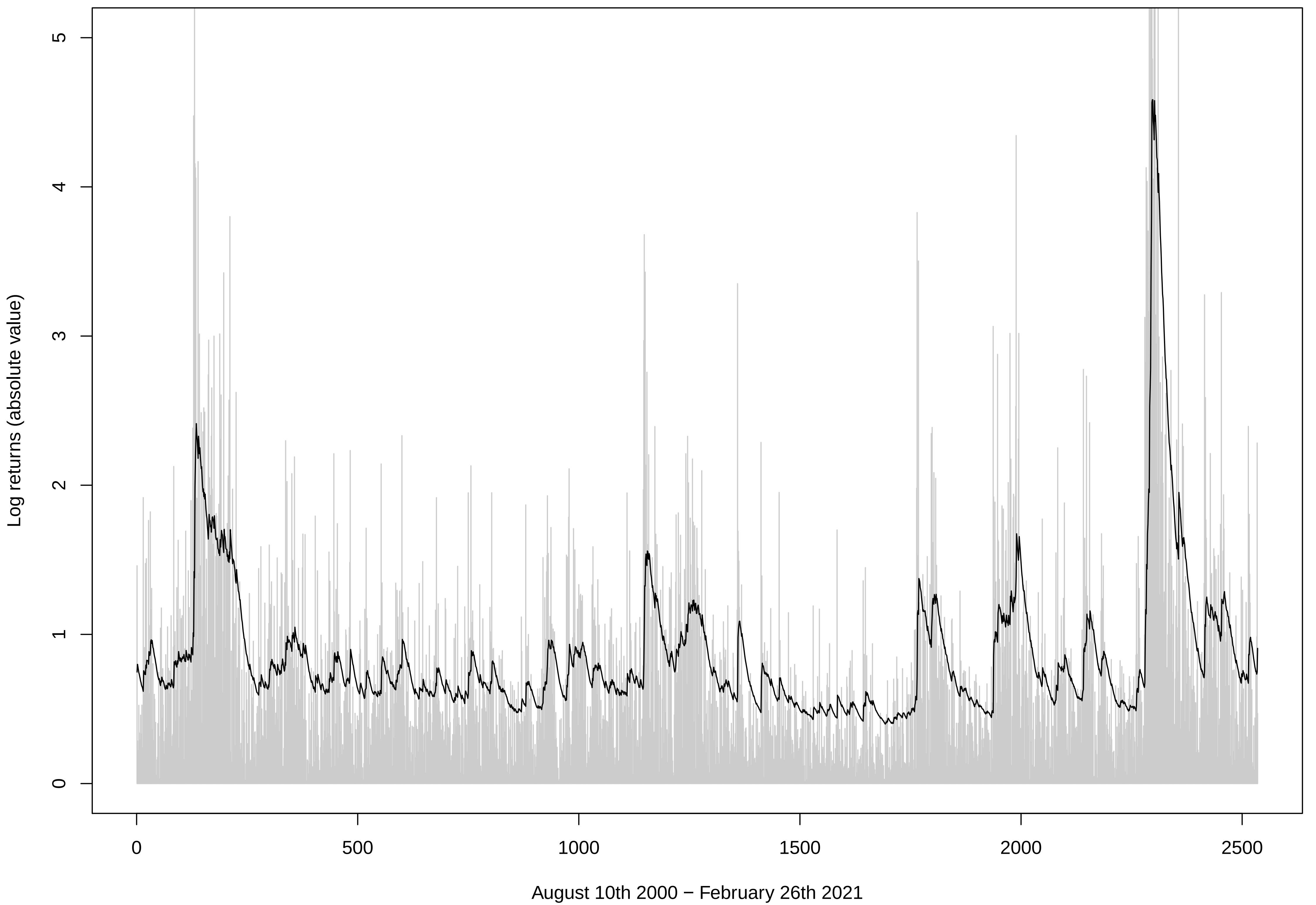
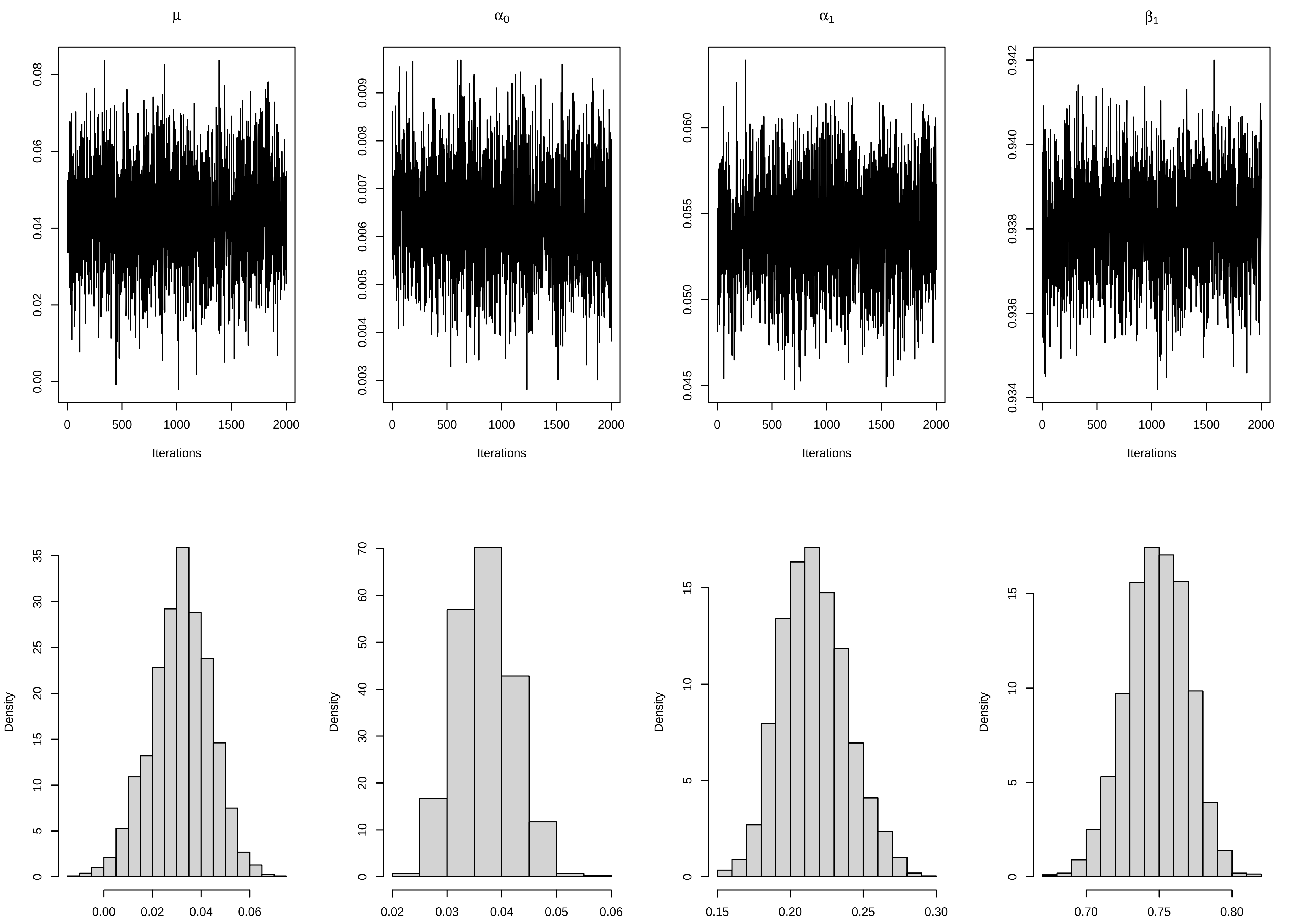

S&P 500 log returns
5
0
−5
−10
0
500
1000
1500
2000
2500
Feb 1 2011 − Feb 26 2021
S&P 500 1−Month Realized Volatility Index
80
60
40
20
0
500
1000
1500
2000
2500
Feb 1 2011 − Feb 26 2021

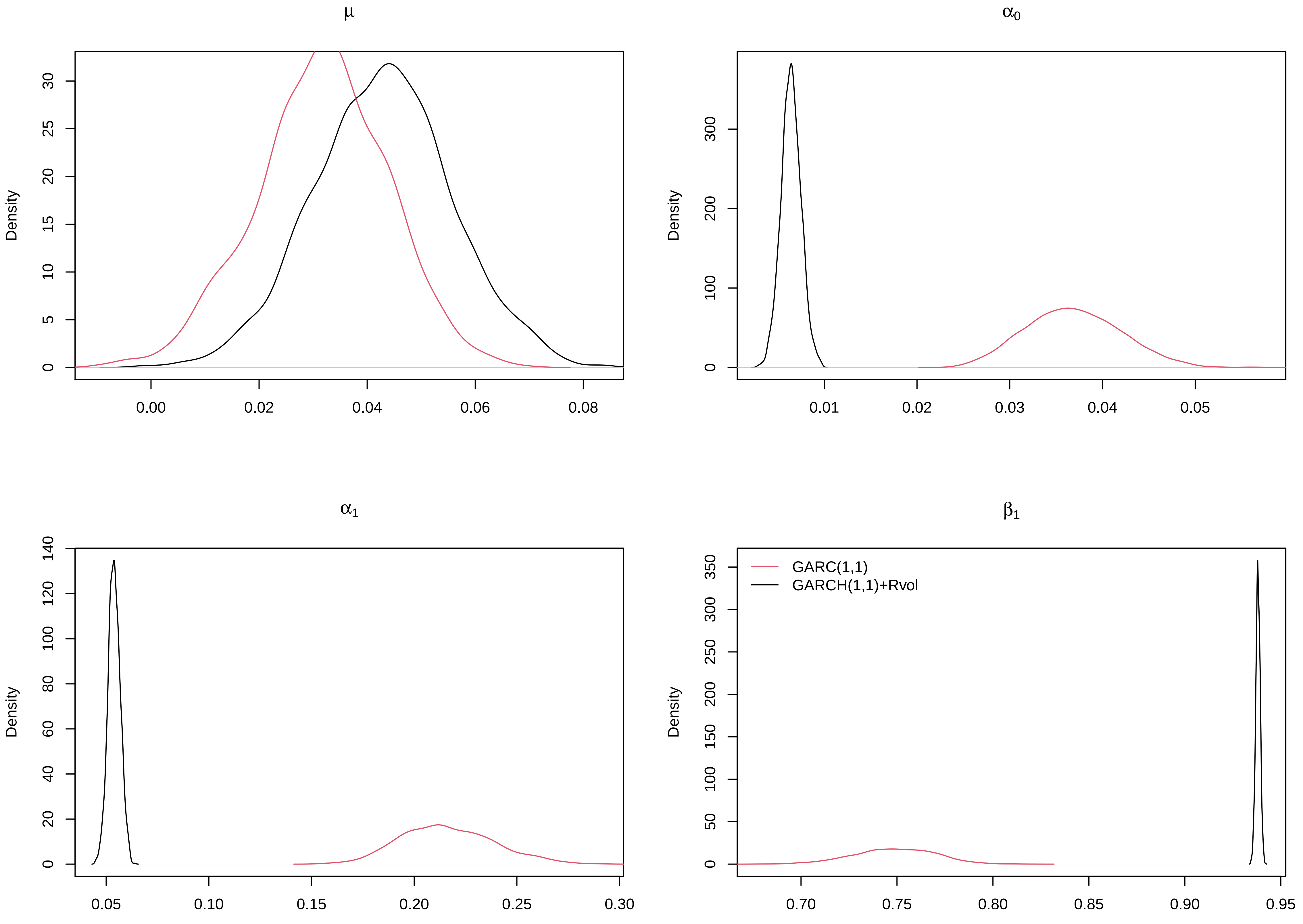

S&P 500 log returns vs realized volatility
0
2
4
6
8
10
12
0
500
1000
1500
2000
2500
Time

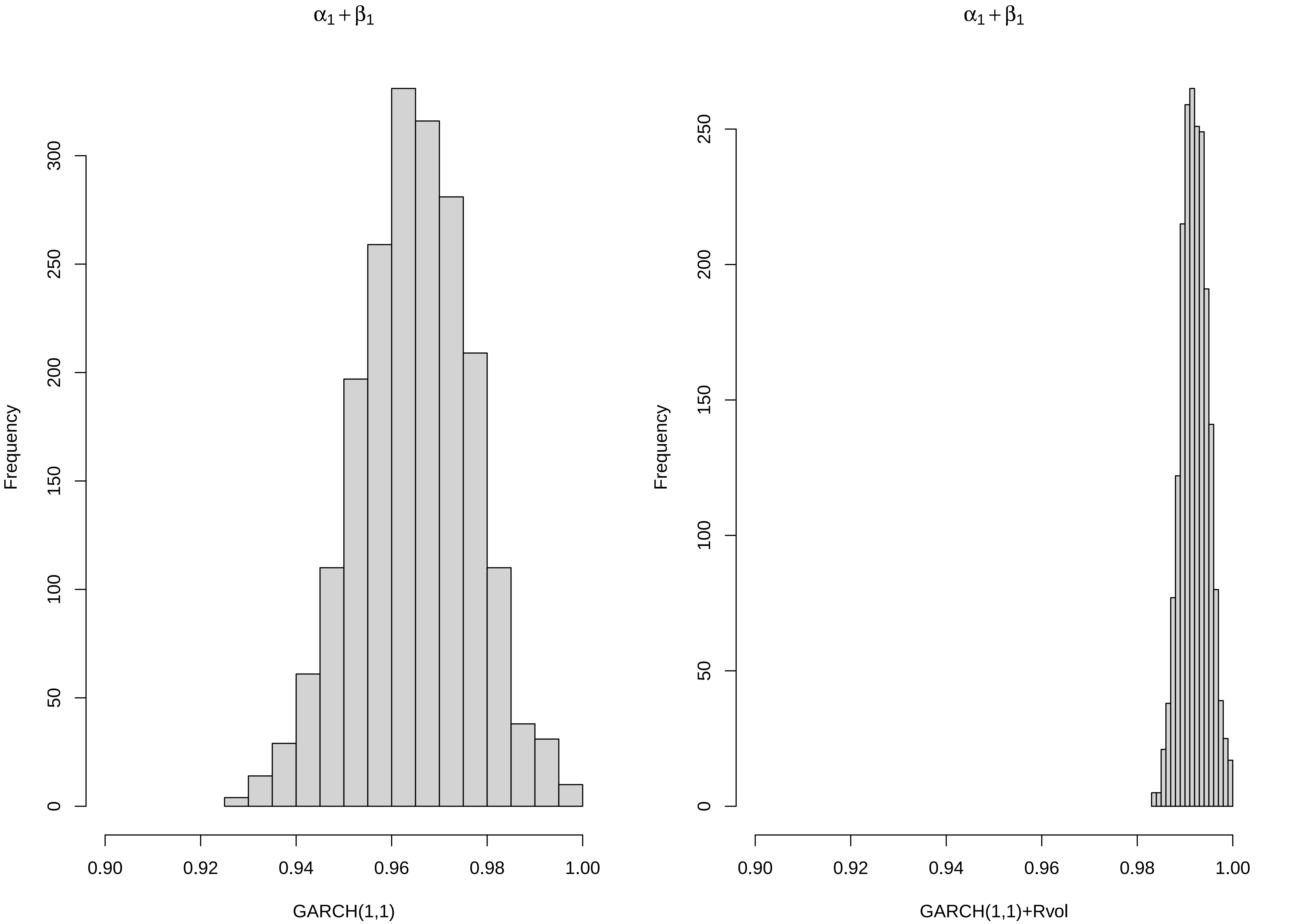


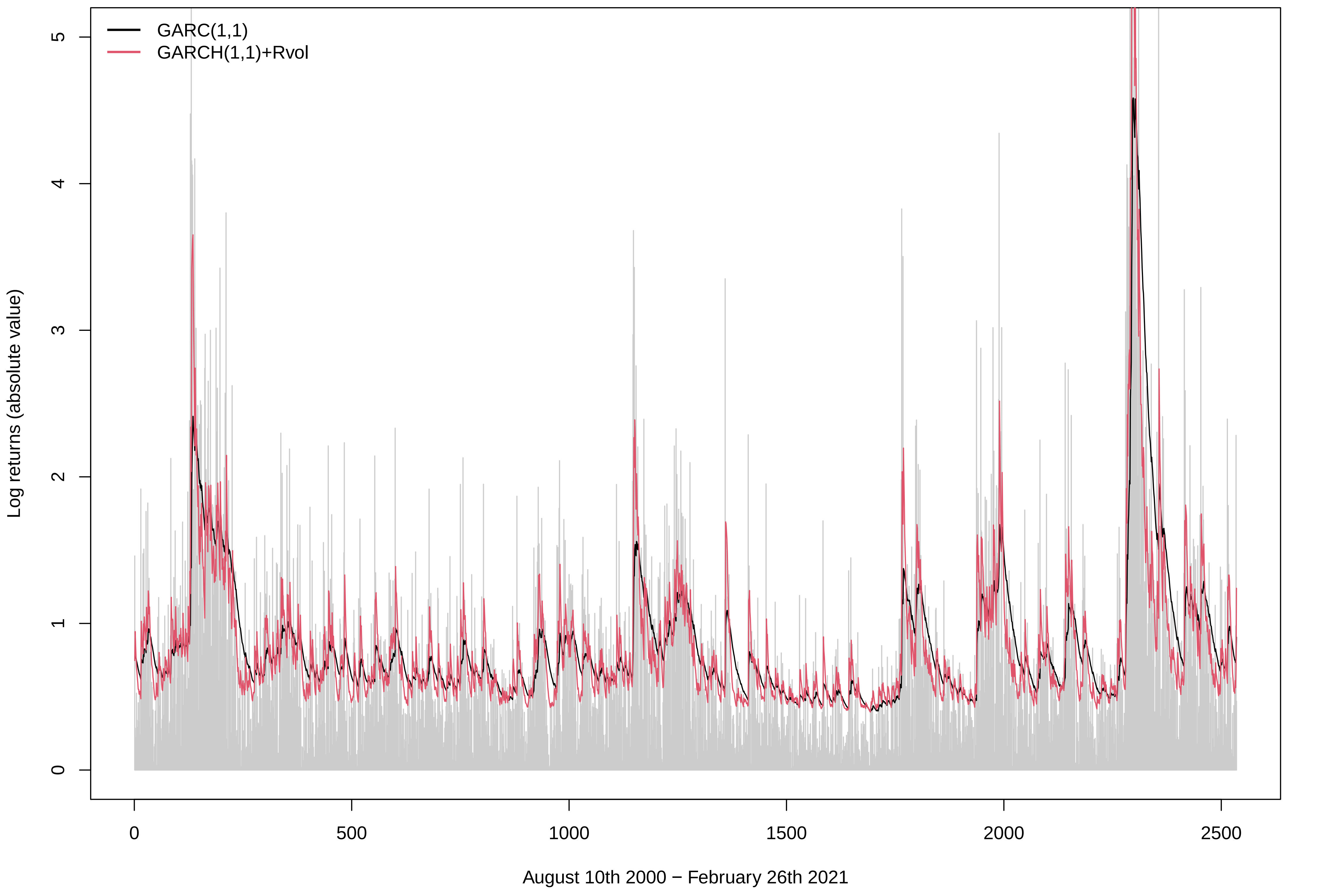
μ
0.00
0.02
0.04
0.06
0.08
0
500
1000
1500
2000
Iterations
α_0
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0
500
1000
1500
2000
Iterations
α_1
0.045
0.050
0.055
0.060
0
500
1000
1500
2000
Iterations
β_1
0.934
0.936
0.938
0.940
0.942
0
500
1000
1500
2000
Iterations
γ_0
9.0
9.2
9.4
9.6
9.8
0
500
1000
1500
2000
Iterations
γ_1
4.5
5.0
5.5
6.0
0
500
1000
1500
2000
Iterations
τ
3.9
4.0
4.1
4.2
0
500
1000
1500
2000
Iterations

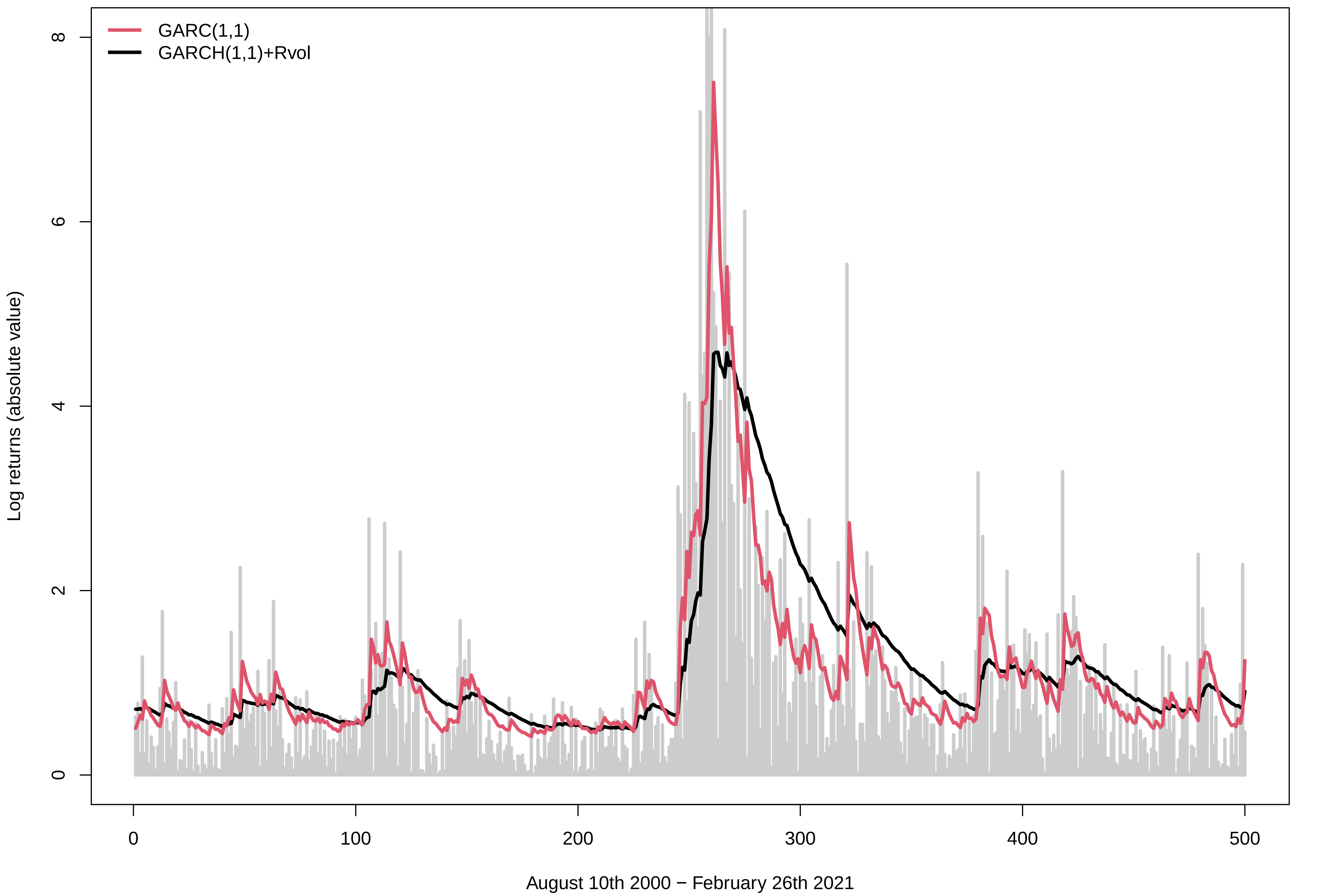

Log returns (absolute value)
0
1
2
3
4
5
0
500
1000
1500
2000
2500
August 10th 2000 − February 26th 2021


μ
α0
α1
β1
Iterations
Iterations
Iterations
Iterations
Density
Density
Density
Density


μ
Density
0.00
0.02
0.04
0.06
0.08
α0
0.01
0.02
0.03
0.04
0.05
α1
0.05
0.10
0.15
0.20
0.25
0.30
β1
GARC(1,1)
GARCH(1,1)+Rvol
0.70
0.75
0.80
0.85
0.90
0.95


$\alpha_1+\beta_1$
Frequency
0
50
100
150
200
250
300
0.90
0.92
0.94
0.96
0.98
1.00
GARCH(1,1)
$\alpha_1+\beta_1$
Frequency
0
50
100
150
200
250
0.90
0.92
0.94
0.96
0.98
1.00
GARCH(1,1)+Rvol


GARC(1,1)
GARCH(1,1)+Rvol
Log returns (absolute value)
0
1
2
3
4
5
0
500
1000
1500
2000
2500
August 10th 2000 − February 26th 2021


GARC(1,1)
GARCH(1,1)+Rvol
Log returns (absolute value)
August 10th 2000 − February 26th 2021
0
2
4
6
8
0
100
200
300
400
500