SDE Parameter Estimation Results

Generated on 2025-03-05 08:46:00

Data Summary:
- Number of observations: 490
- Time period: 2022-01-04 to NaT
- Time step (dt): 0.003968 years
- Mean price: 3860.17
- Price volatility: 0.2815 (annualized)

Model Specification:

δS_t = r S_t δt + β L_t S_t δW_t^γ + σ_S S_t δW_t^S

δL_t = α(θ̄ - L_t)δt + σ_L δW_t^L

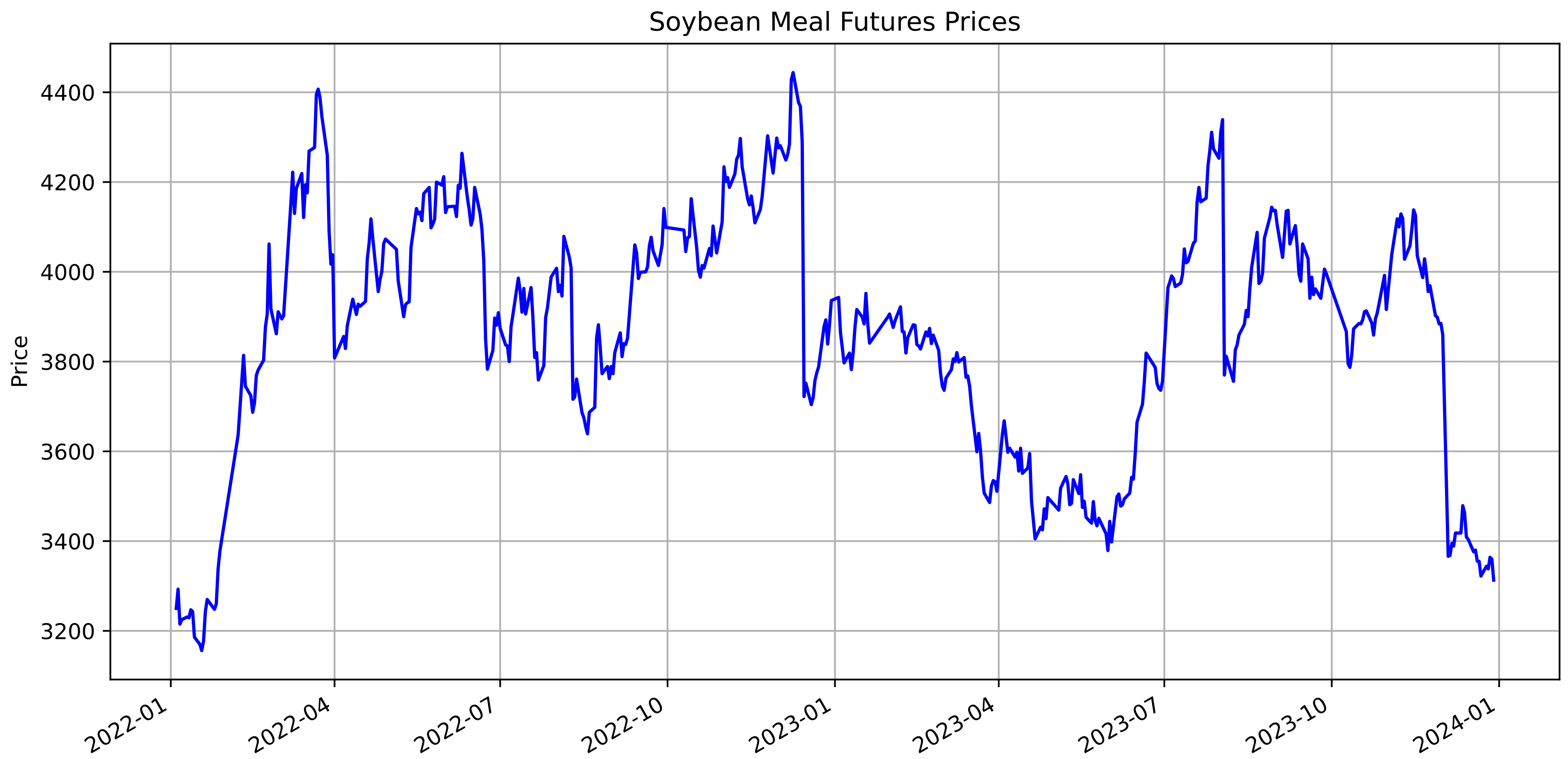
Estimation Method:

Extended Kalman Filter with Maximum Likelihood Estimation

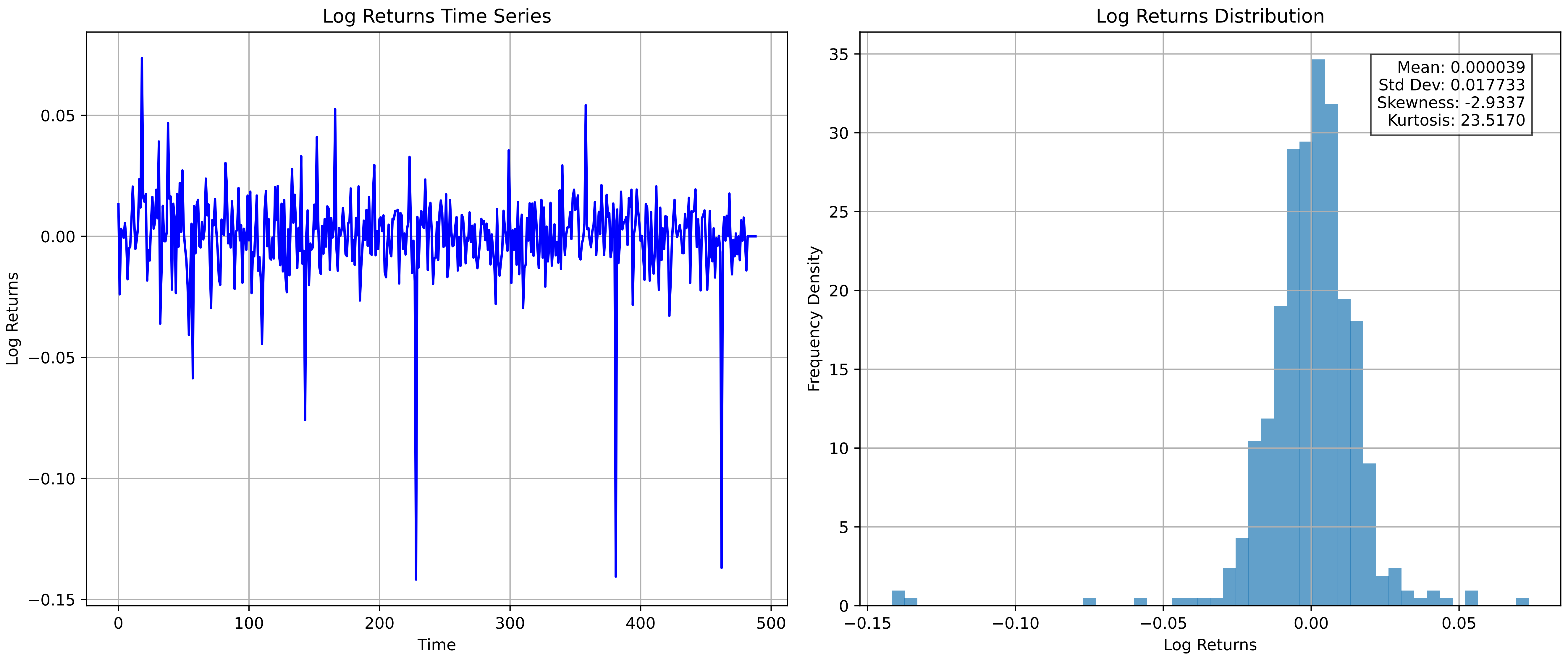
Parameter Estimates

Parameter	Estimate	Std Error	z-value	Pr(>|z|)	Significance
r	0.047776	0.197003	0.242513	0.808383	
alpha	0.489760	1.308486	0.374296	0.708184	
beta	0.248228	1.966182	0.126249	0.899535	
theta_bar	1.000000	NaN	NaN	NaN	
sigma_S	0.273220	0.009572	28.542159	0.000000	***
sigma_L	0.199077	NaN	NaN	NaN	
rho1	0.300000	0.000000	inf	0.000000	***
rho2	0.200000	0.000000	inf	0.000000	***
rho3	0.100000	0.000000	inf	0.000000	***

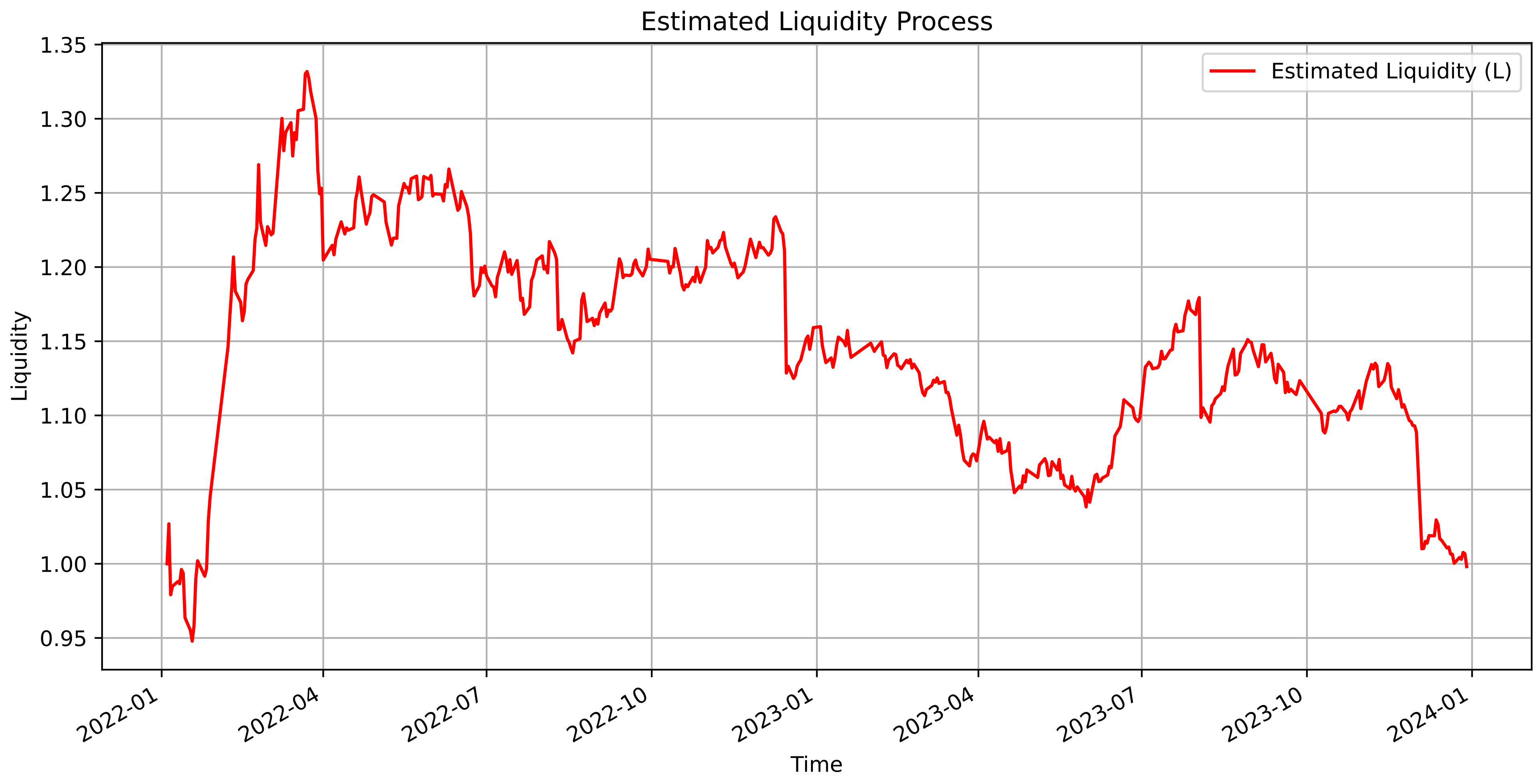
Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

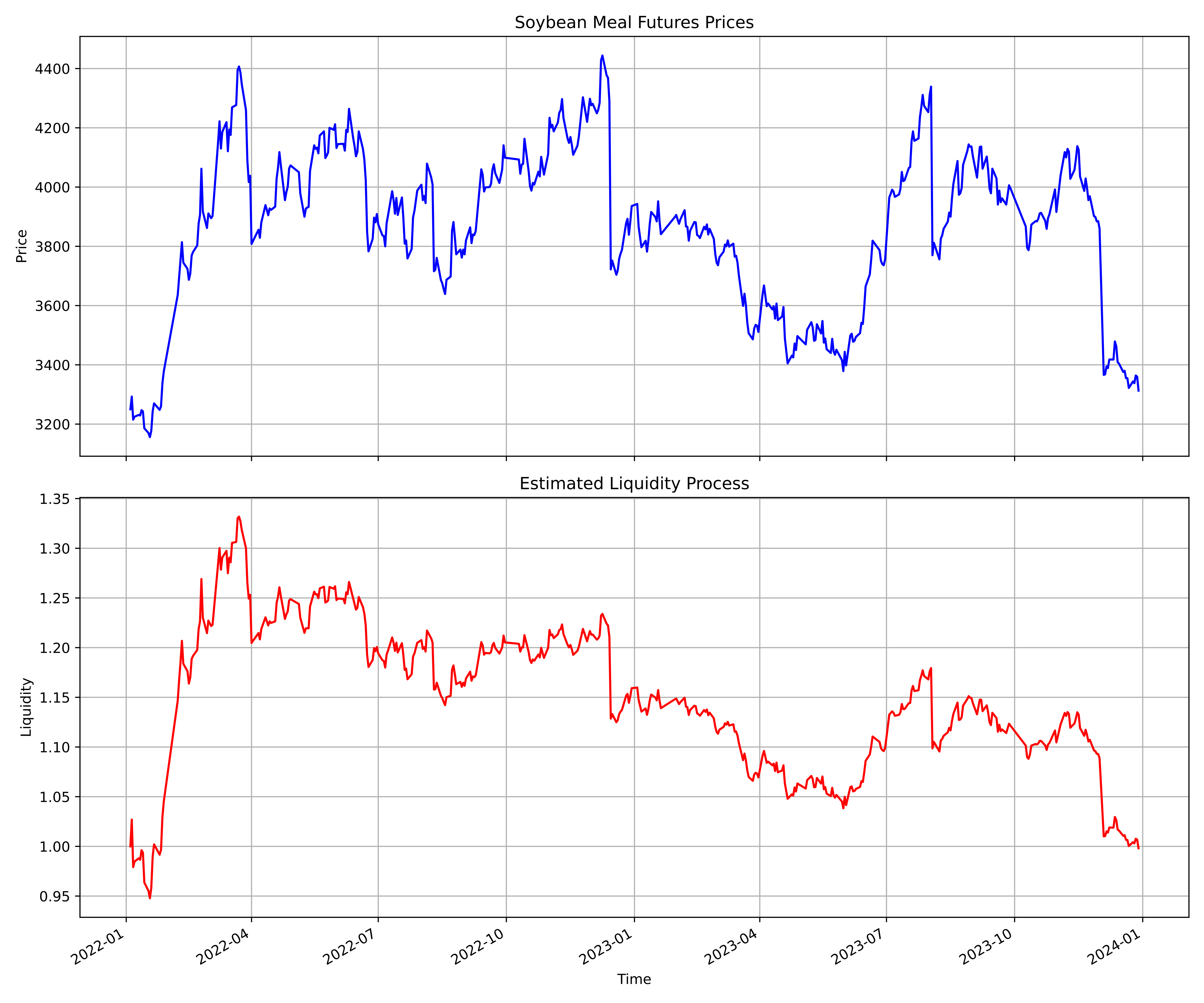


Soybean Meal Futures Prices
Price
4400
4200
4000
3800
3600
3400
3200
2022-01
2022-04
2022-07
2022-10
2023-01
2023-04
2023-07
2023-10
2024-01



Log Returns Time Series
Log Returns
Time
0.05
0.00
−0.05
−0.10
−0.15
0
100
200
300
400
500
Log Returns Distribution
Frequency Density
Log Returns
Mean: 0.000039
Std Dev: 0.017733
Skewness: -2.9337
Kurtosis: 23.5170
35
30
25
20
15
10
5
0
−0.15
−0.10
−0.05
0.00
0.05


Estimated Liquidity Process
Estimated Liquidity (L)
Liquidity
Time
1.35
1.30
1.25
1.20
1.15
1.10
1.05
1.00
0.95
2022-01
2022-04
2022-07
2022-10
2023-01
2023-04
2023-07
2023-10
2024-01



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2022-01
2022-04
2022-07
2022-10
2023-01
2023-04
2023-07
2023-10
2024-01
Time