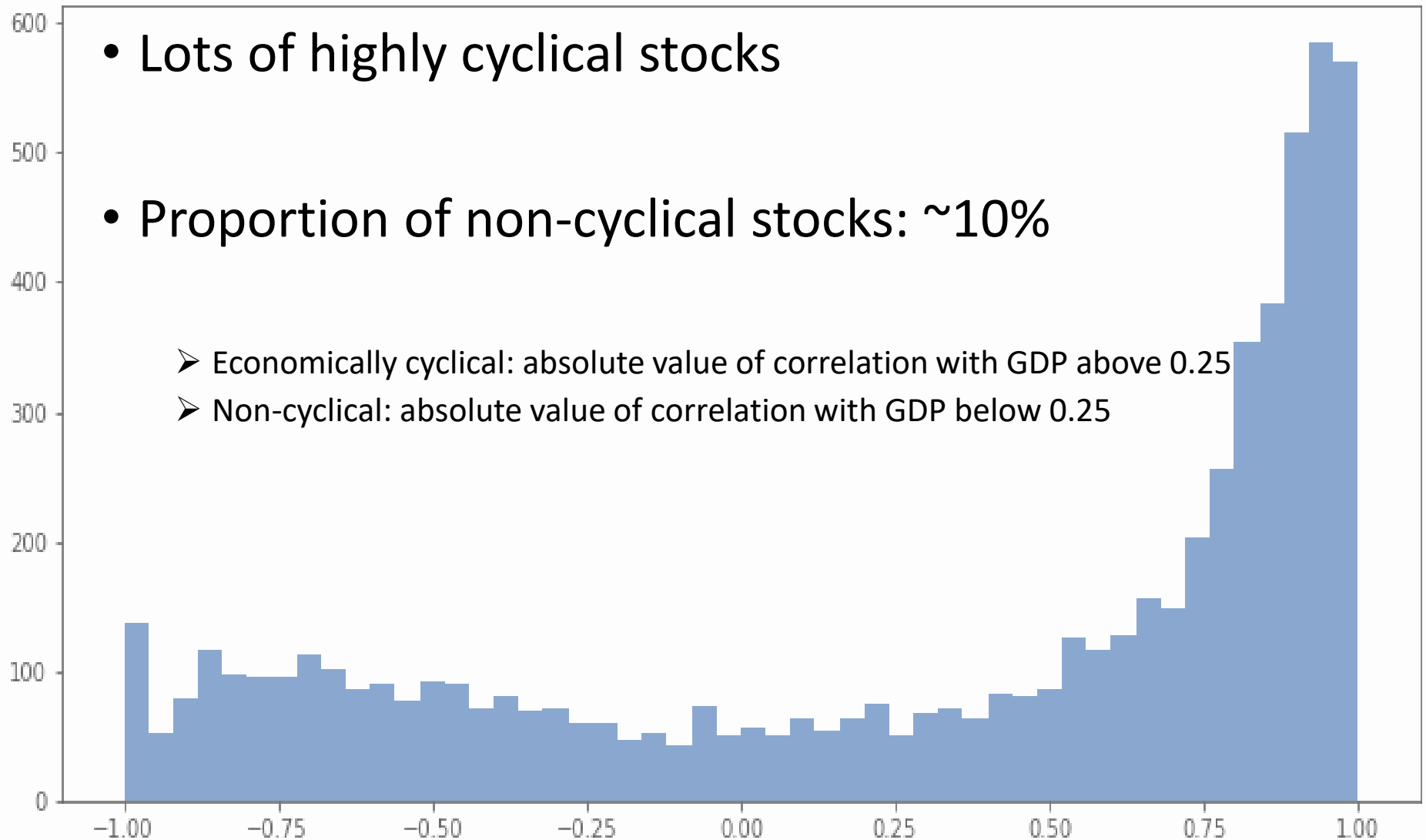


Stock Analysis

Johnny Trinh

Economic cyclicity

- Lots of highly cyclical stocks
- Proportion of non-cyclical stocks: ~10%
 - Economically cyclical: absolute value of correlation with GDP above 0.25
 - Non-cyclical: absolute value of correlation with GDP below 0.25



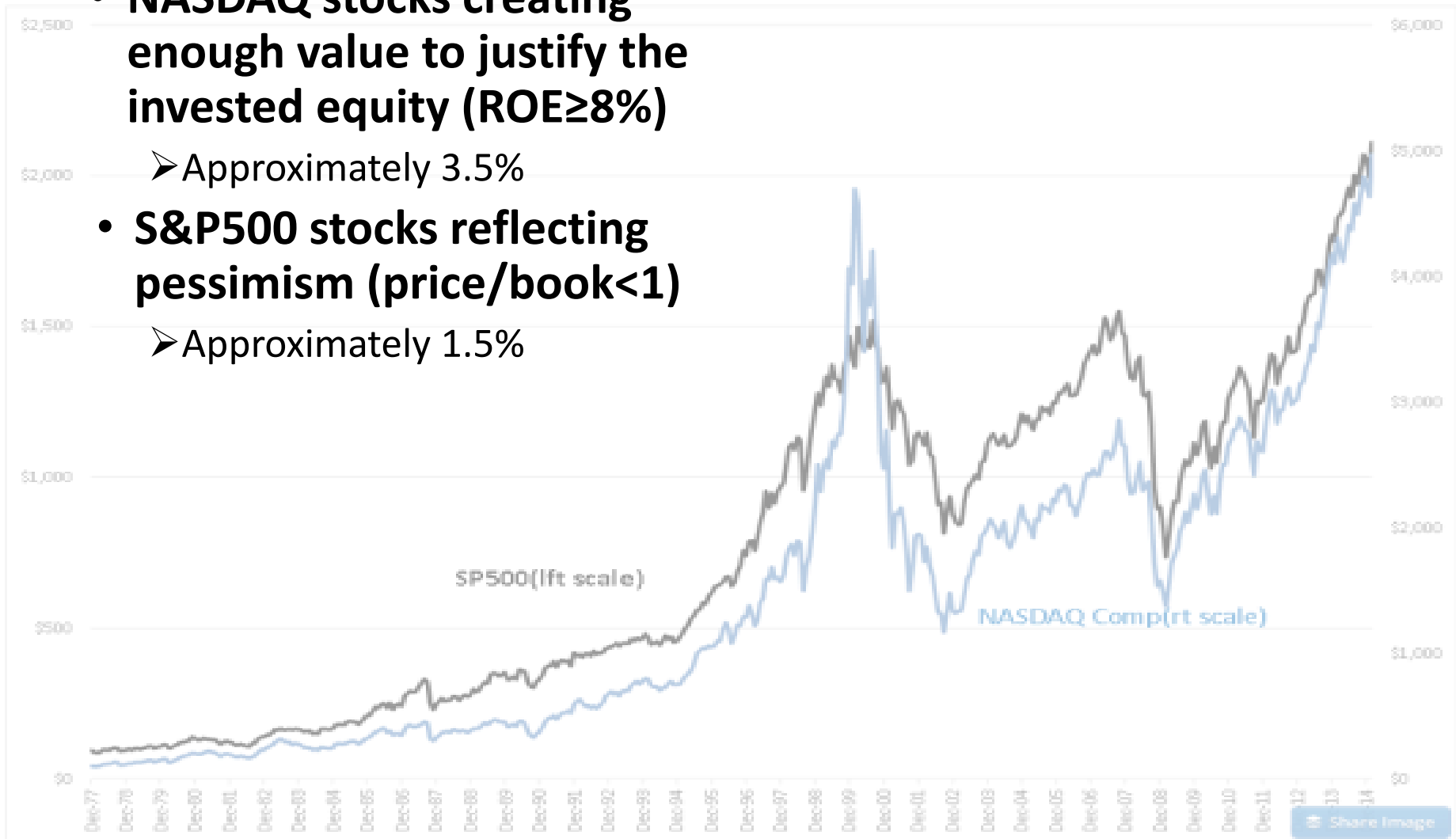
Economic value and pessimism

- **NASDAQ stocks creating enough value to justify the invested equity ($ROE \geq 8\%$)**

➤ Approximately 3.5%

- **S&P500 stocks reflecting pessimism ($price/book < 1$)**

➤ Approximately 1.5%

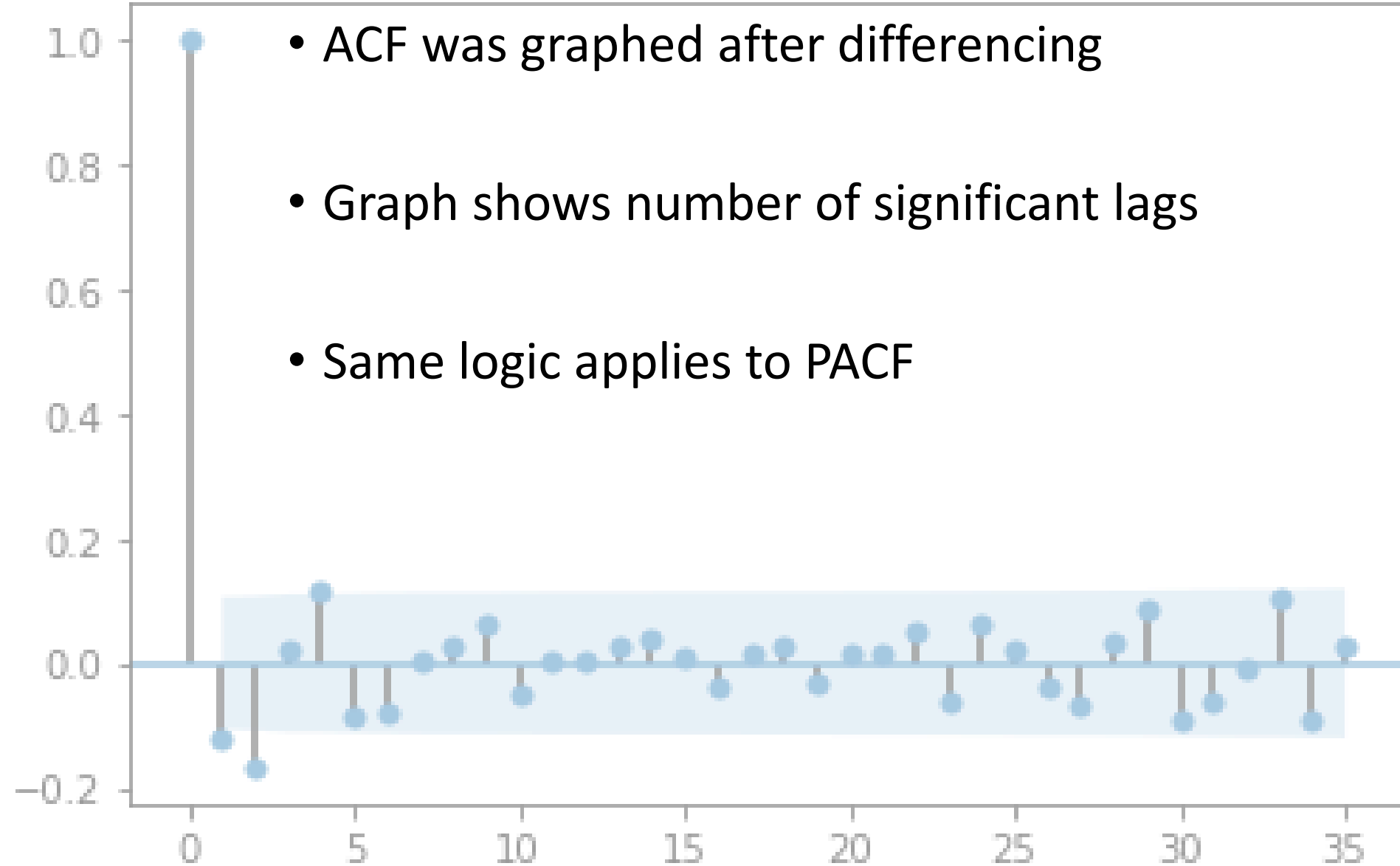


Machine Learning Questions

- Optimal Box-Jenkins modelling
 1. Augmented Dickey-Fuller Test (unit root testing)
 2. Autocorrelation and Partial Autocorrelation Function
 3. Akaike Information Criterion (AIC)
- Evaluation metrics versus selection metrics
 - Determine the best model based on evaluation metrics
 - Compare with optimal model from AIC

Autocorrelation Function

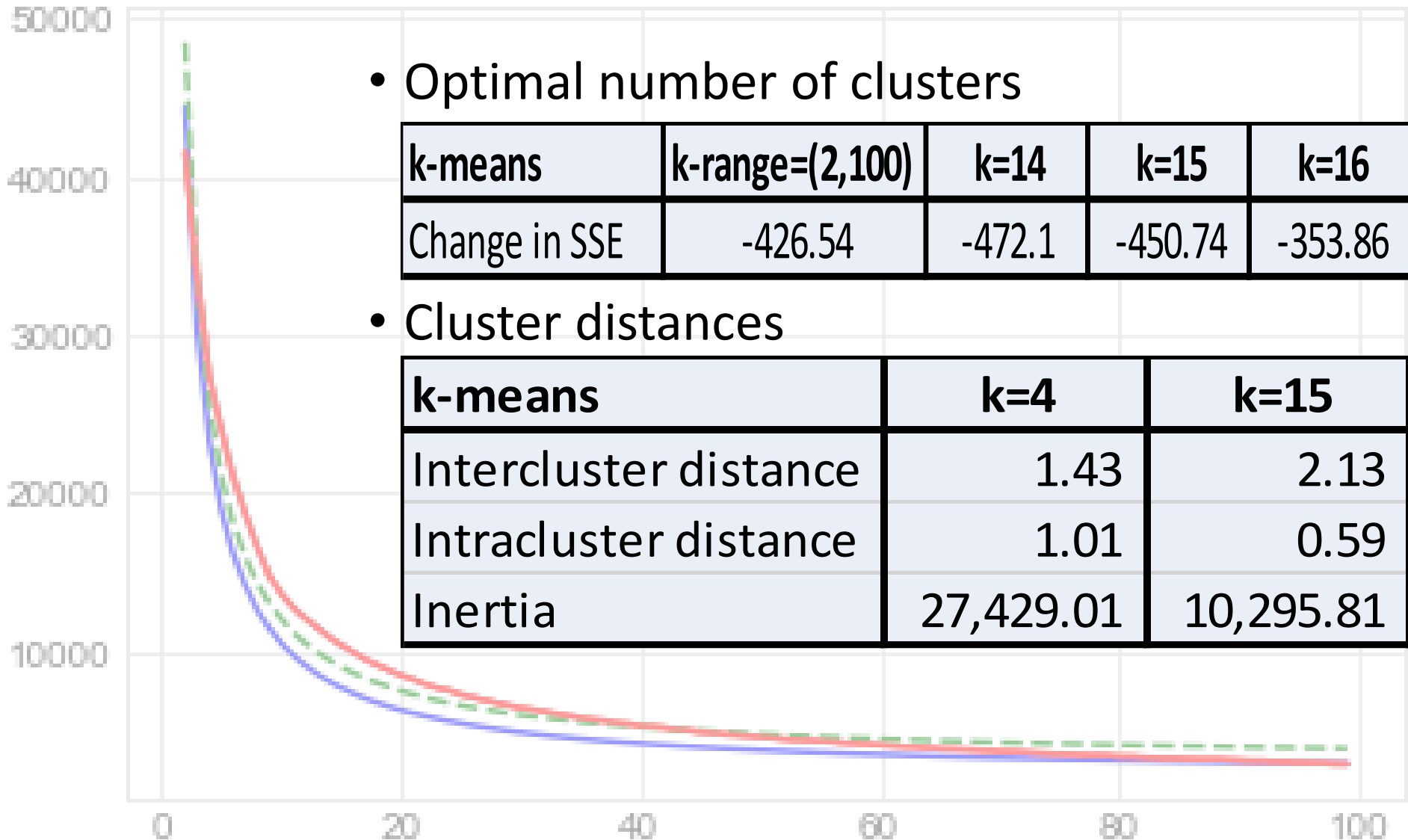
- ACF was graphed after differencing
- Graph shows number of significant lags
- Same logic applies to PACF



Box-Jenkins Model Results

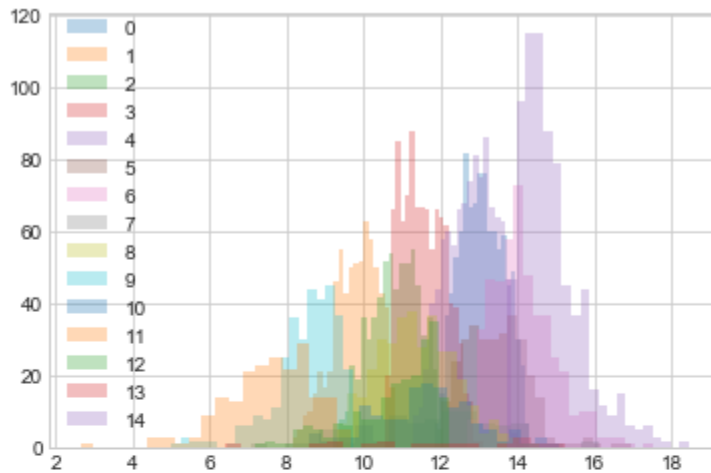
ARIMA Model Results						
Dep. Variable:	D.Close	No. Observations:	12652			
Model:	ARIMA(3, 1, 3)	Log Likelihood	-1645.414			
Method:	css-mle	S.D. of innovations	0.276			
Date:	Mon, 04 Jun 2018	AIC	3306.827			
Time:	16:57:29	BIC	3366.392			
Sample:	01-03-1962	HQIC	3326.756			
	- 04-13-2012					
	coef	std err	z	P> z	[0.025	0.975]
const	0.0012	0.002	0.590	0.555	-0.003	0.005
ar.L1.D.Close	0.0356	0.090	0.395	0.693	-0.141	0.212
ar.L2.D.Close	-0.1833	0.060	-3.071	0.002	-0.300	-0.066
ar.L3.D.Close	0.6398	0.054	11.806	0.000	0.534	0.746
ma.L1.D.Close	-0.0693	0.091	-0.762	0.446	-0.248	0.109
ma.L2.D.Close	0.1243	0.061	2.037	0.042	0.005	0.244
ma.L3.D.Close	-0.6292	0.053	-11.937	0.000	-0.732	-0.526
Roots						
	Real	Imaginary	Modulus	Frequency		
AR.1	-0.4803	-1.0113j	1.1196	-0.3206		
AR.2	-0.4803	+1.0113j	1.1196	0.3206		
AR.3	1.2470	-0.0000j	1.2470	-0.0000		
MA.1	-0.5030	-1.0333j	1.1492	-0.3221		
MA.2	-0.5030	+1.0333j	1.1492	0.3221		
MA.3	1.2034	-0.0000j	1.2034	-0.0000		

Clustering Questions

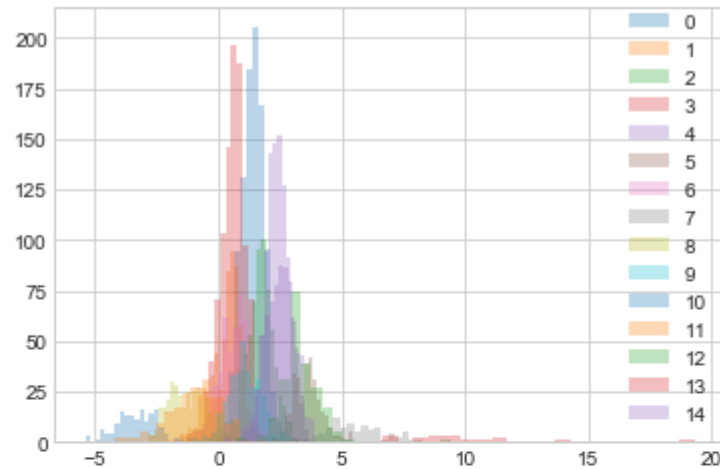


Clustering Results

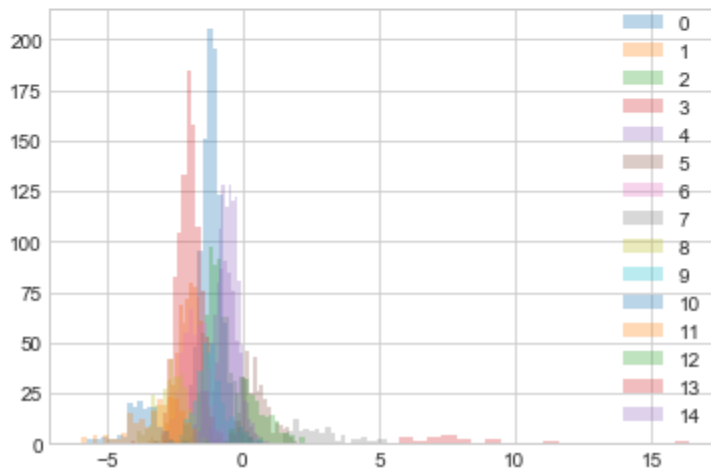
Volume



plevel



change



spread

