Outline

Initial Plots
Differencing
ACF & PACF

Model Comparisons

Seasonal Models

Seasonally Adjusted Models

US Unemployment Trends

Initial Model Selection

Joseph Blubaugh Sean Roberson Akarshan Puri
Alison Shelton Travis Lilley Bo Pang

Texas A&M
College Station, Texas

STAT 626: Time Series Analysis

Outline

Outline

Initial Plots
Differencing
ACF & PACF

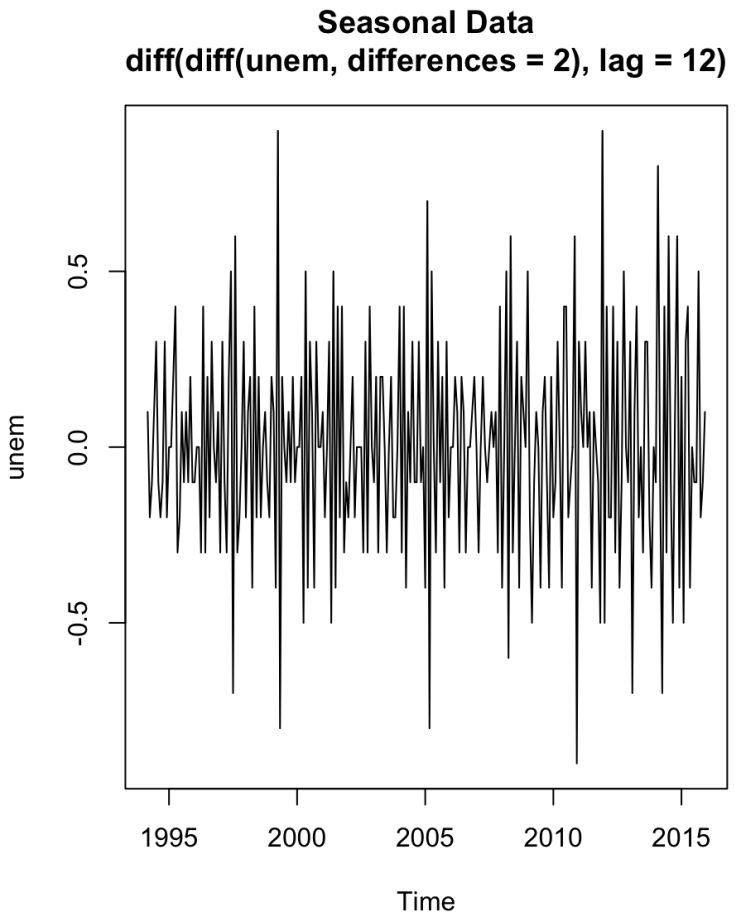
Model Comparisons

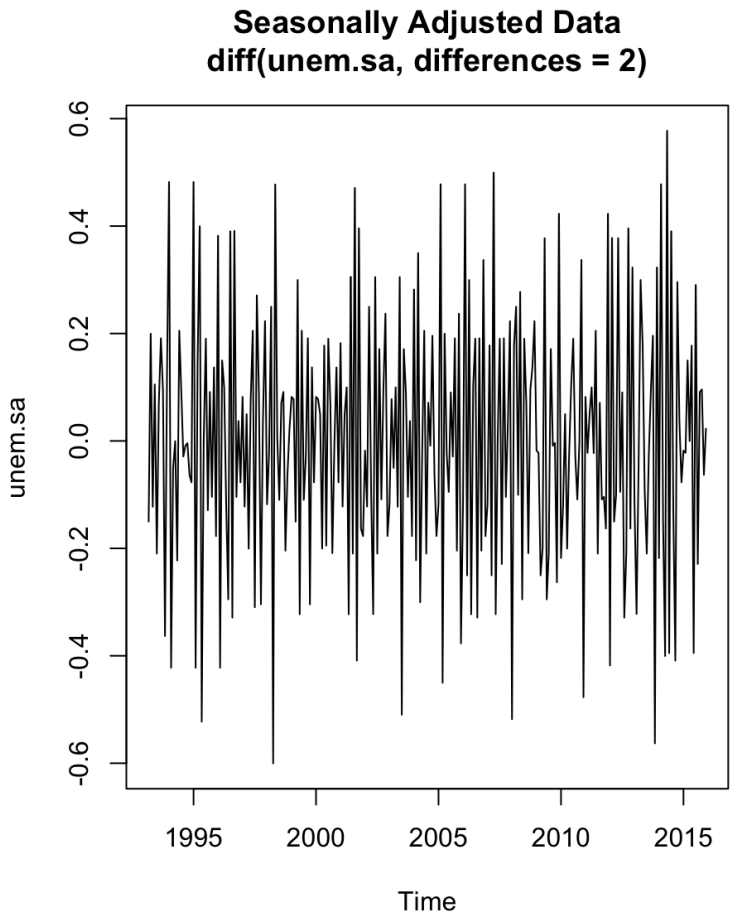
Seasonal Models

Seasonally Adjusted Models

1. Initial Plots
   - Differencing
   - ACF & PACF
2. Model Comparisons
3. Seasonal Models
4. Seasonally Adjusted Models

Second differences with and without seasonal adjustments





ACF & PACF Plots

Unemployment Trends

Group 4

Outline

Initial Plots

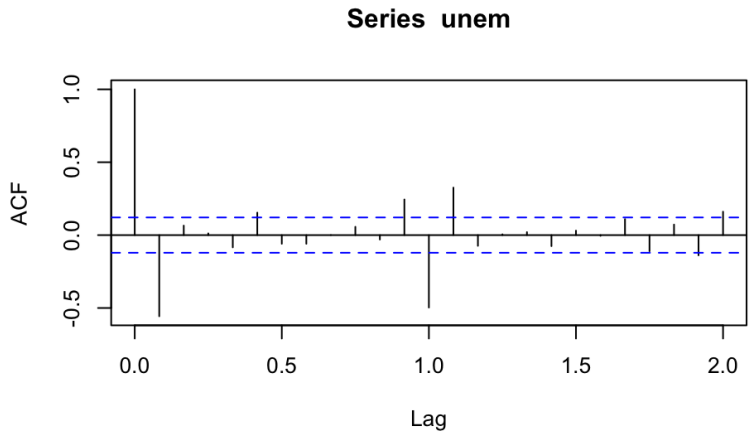
Differencing

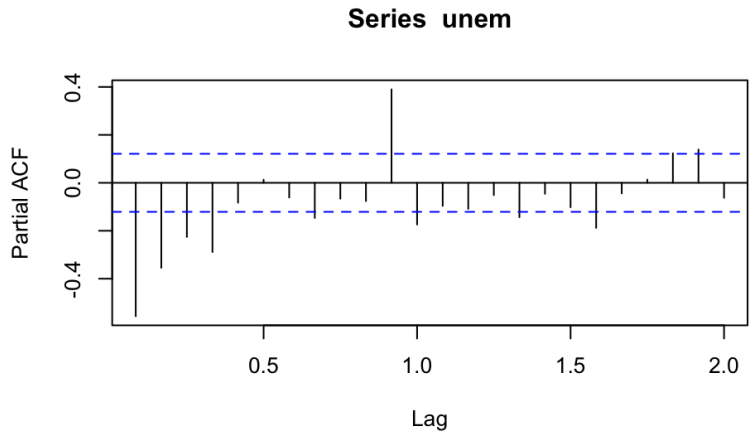
ACF & PACF

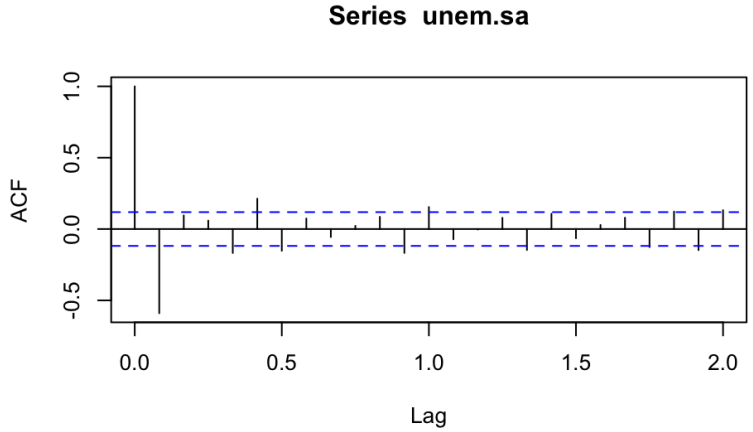
Model Comparisons

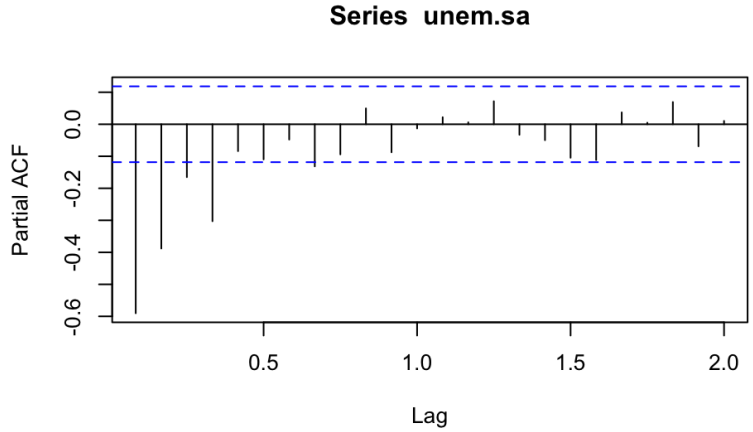
Seasonal Models

Seasonally Adjusted Models









Models Considered

Table: Model Summaries

#	Data	Order	Seasonal Order	XRegs	AIC	BIC
1	Unem	0,2,1	1,1,0	N	-2.27	-3.23
2	Unem	0,2,1	3,1,0	N	-2.44	-3.37
3	Unem	4,2,1	3,1,0	N	-2.44	-3.32
4	Unem.sa	0,2,1	1,0,0	N	-2.61	-3.58
5	Unem.sa	1,2,1		N	-2.63	-3.60
6	Unem.sa	0,2,1	1,0,0	Y	-2.58	-3.49
7	Unem.sa	1,2,1		Y	-2.60	-3.49

Model 1: SARIMA$(0, 2, 1) \times (1, 1, 0)_{12}$

Unemployment Trends

Group 4

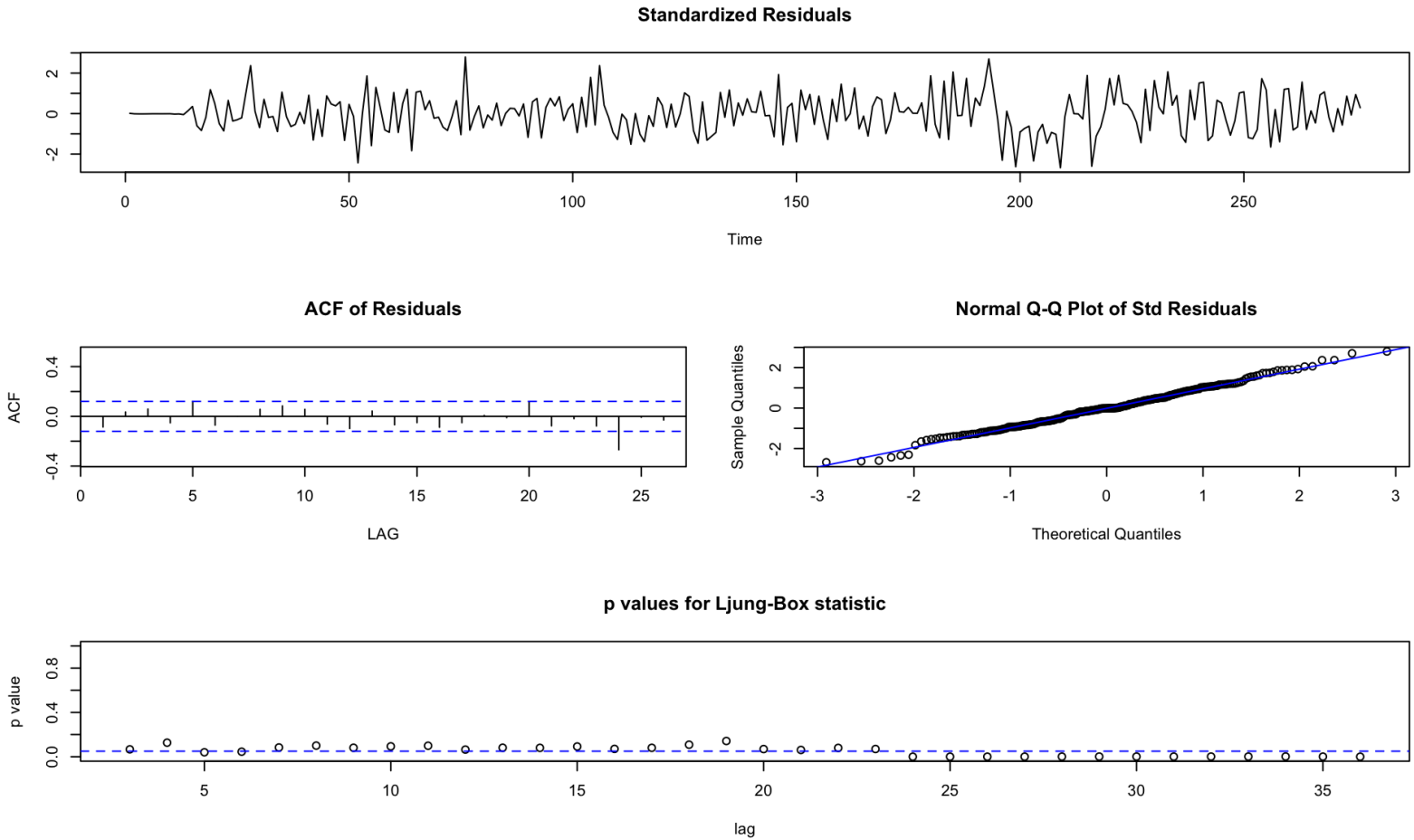
Outline

Initial Plots
Differencing
ACF & PACF

Model Comparisons

Seasonal Models

Seasonally Adjusted Models



Model 2: SARIMA$(0, 2, 1) \times (3, 1, 0)_{12}$

Unemployment Trends

Group 4

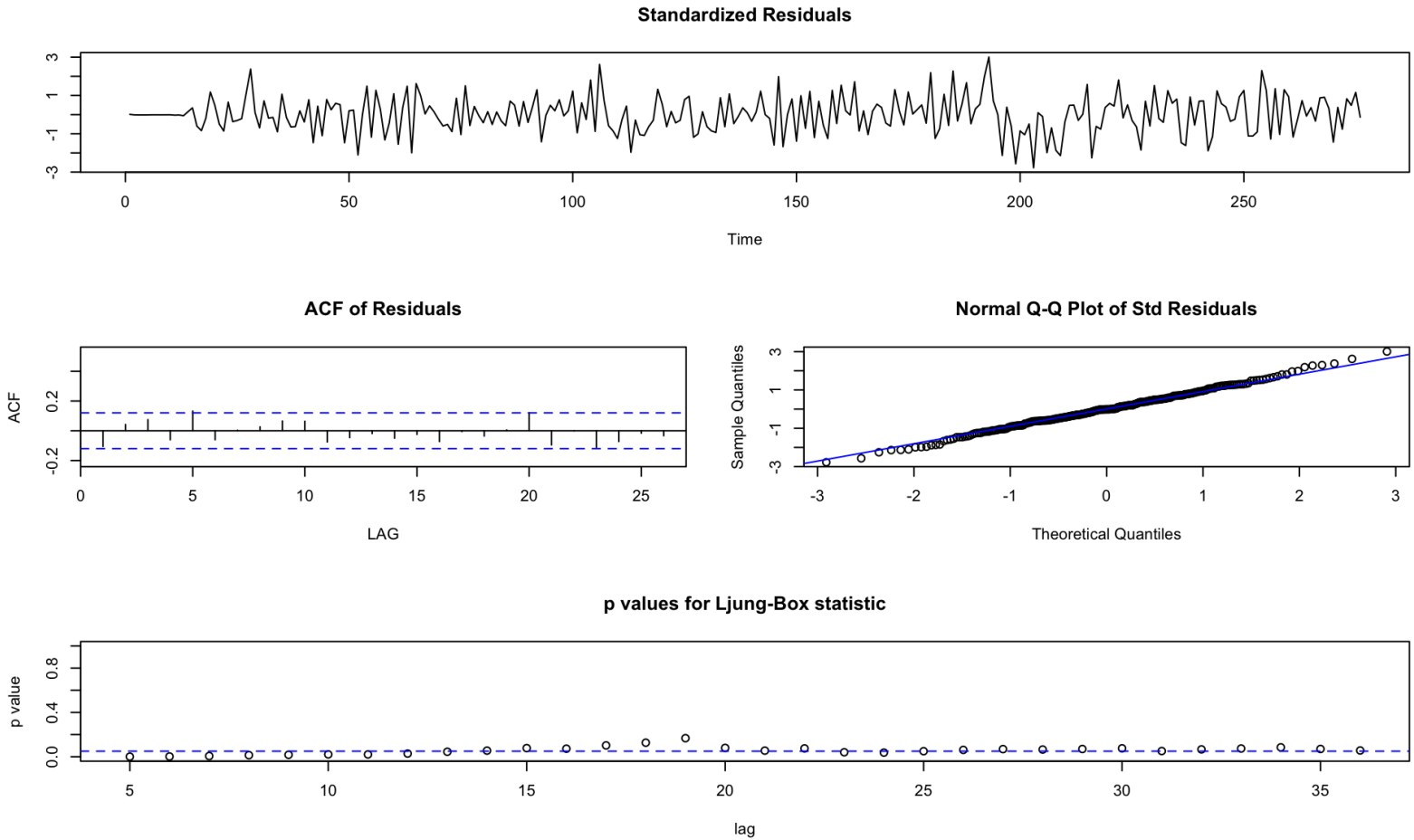
Outline

Initial Plots
Differencing
ACF & PACF

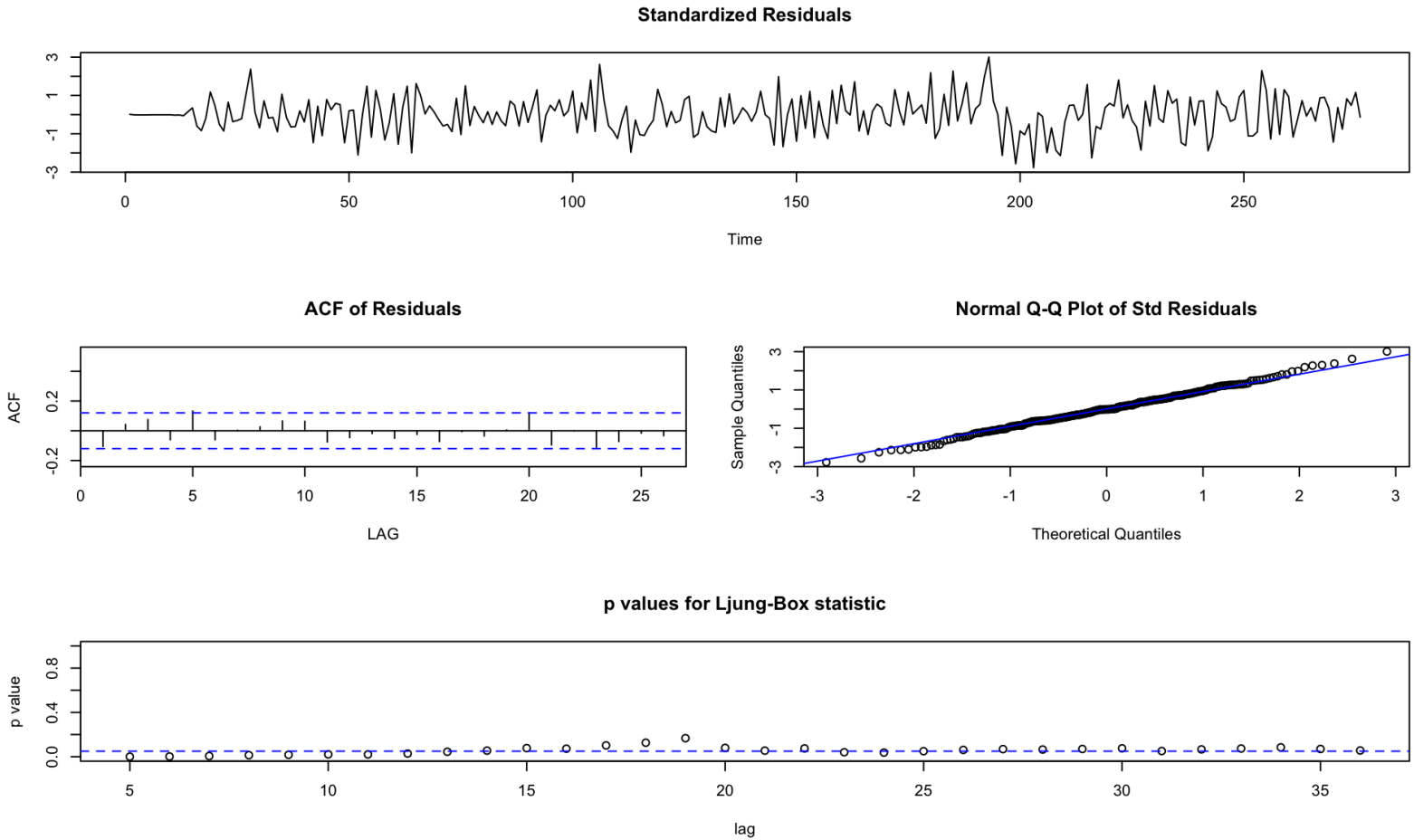
Model Comparisons

Seasonal Models

Seasonally Adjusted Models



Model 3: SARIMA$(4, 2, 1) \times (3, 1, 0)_{12}$



Model 4: SARIMA$(0, 2, 1) \times (1, 0, 0)_{12}$

Unemployment Trends

Group 4

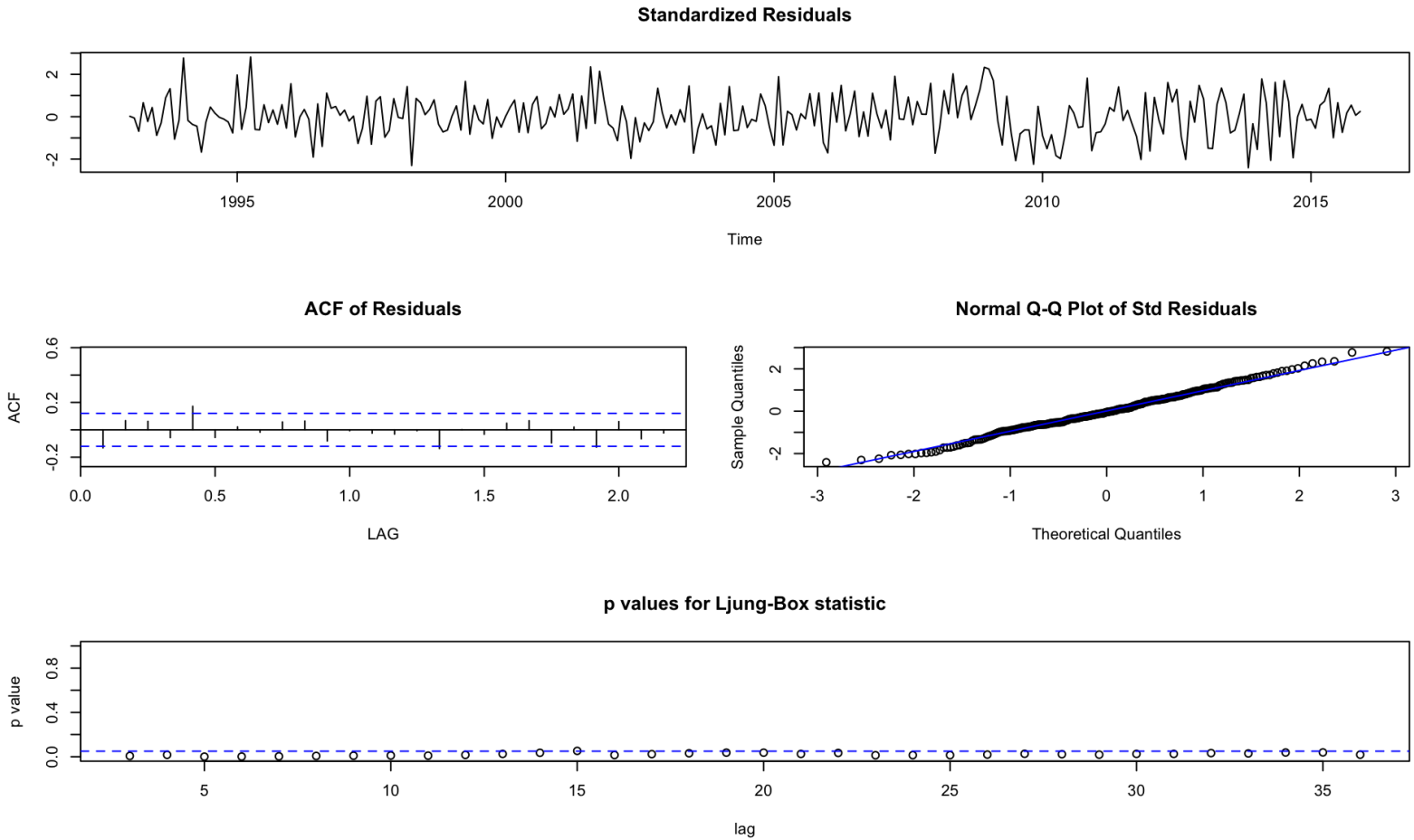
Outline

Initial Plots
Differencing
ACF & PACF

Model Comparisons

Seasonal Models

Seasonally Adjusted Models



Model 5: ARIMA(1, 2, 1)

Unemployment Trends

Group 4

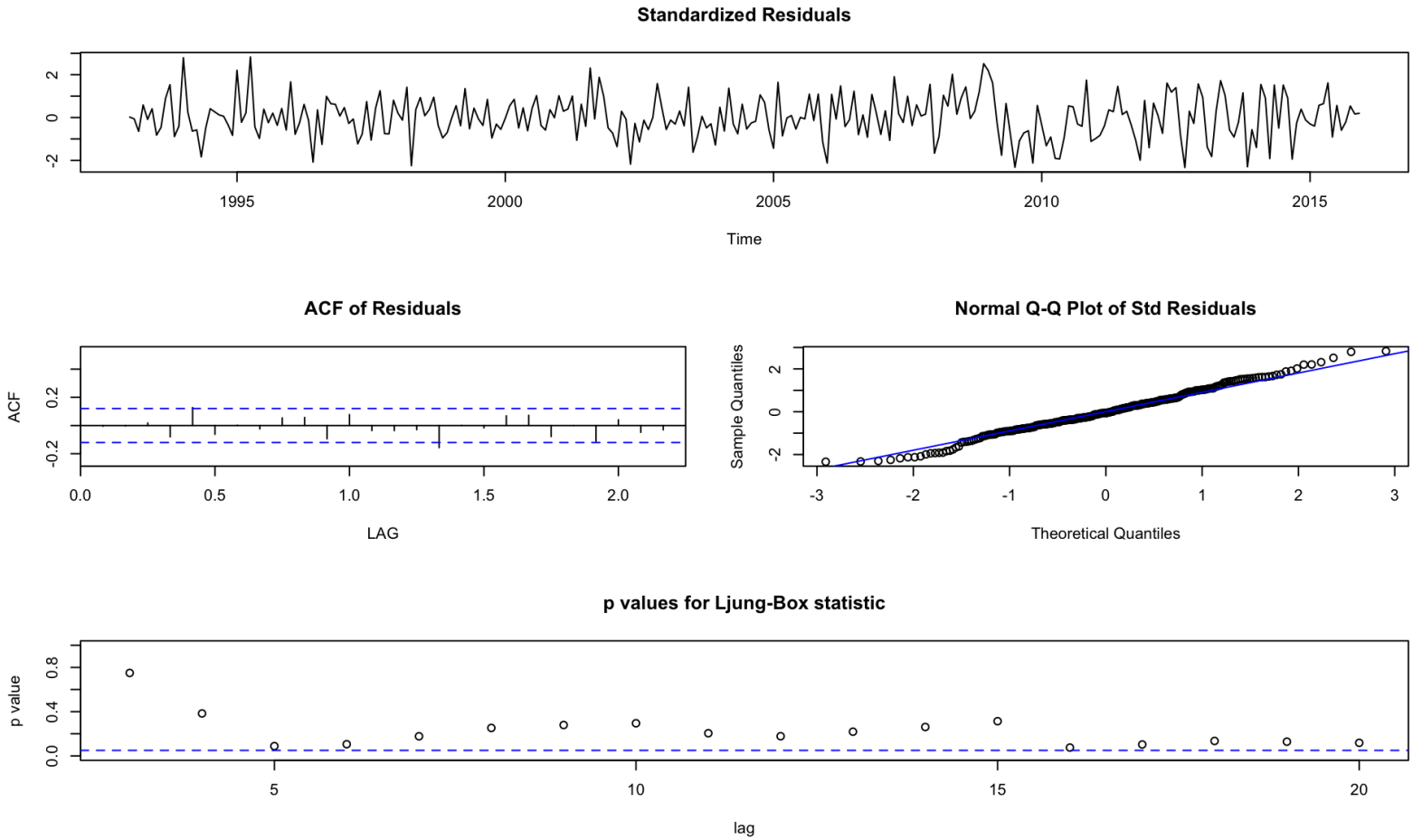
Outline

Initial Plots
Differencing
ACF & PACF

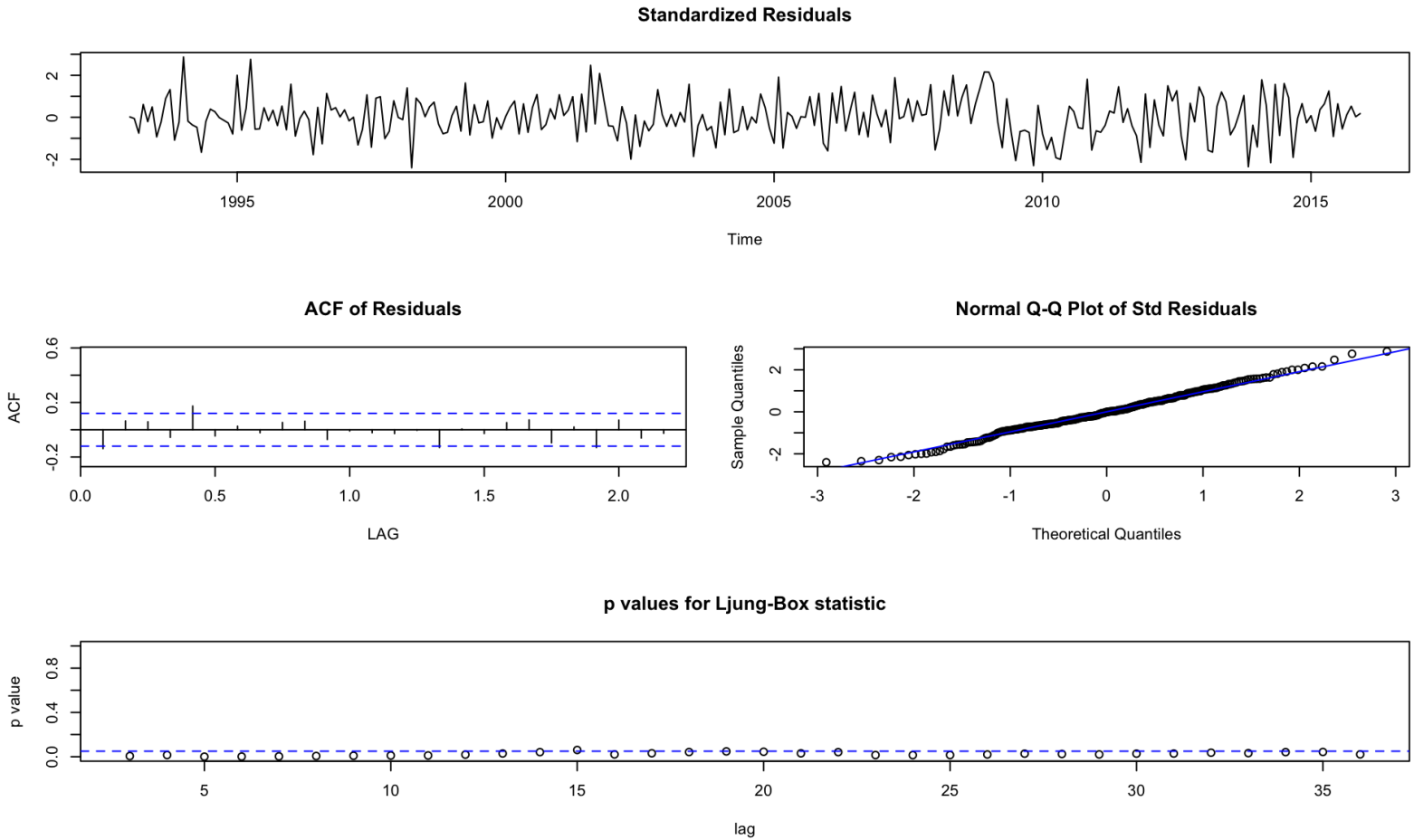
Model Comparisons

Seasonal Models

Seasonally Adjusted Models



Model 6: SARIMA$(0, 2, 1) \times (1, 0, 0)_{12}$ with Regressors



Model 7: ARIMA(1, 2, 1) with Regressors

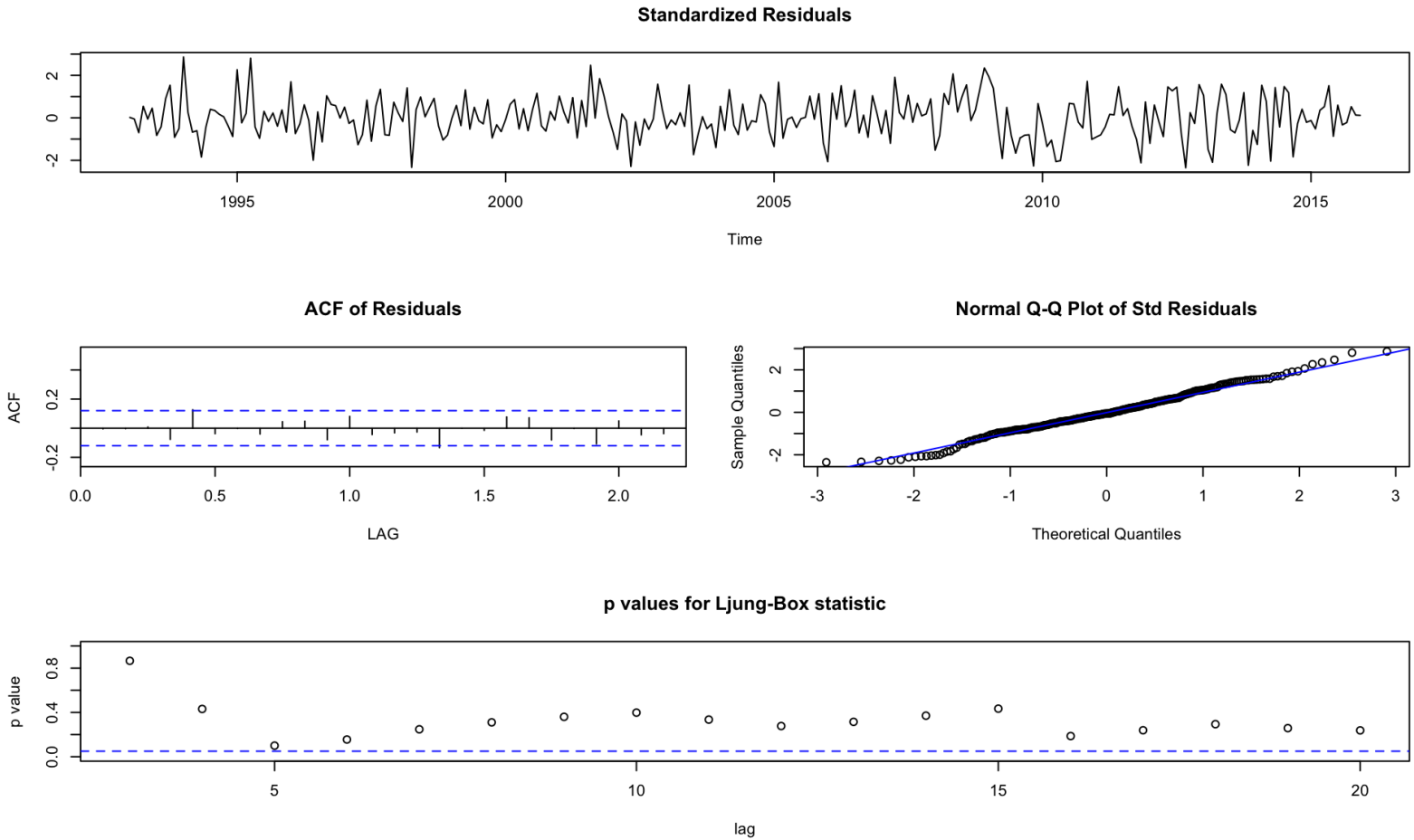
Unemployment Trends

Group 4

Outline

Initial Plots
Differencing
ACF & PACF

Model Comparisons

Seasonal Models

Seasonally Adjusted Models