

## The SAS System

The REG Procedure  
 Model: MODEL1  
 Dependent Variable: Ln\_G\_Pop

### Appendix 2

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	0.79679	0.08853	268.77	<.0001
Error	26	0.00856	0.00032940		
Corrected Total	35	0.80535			

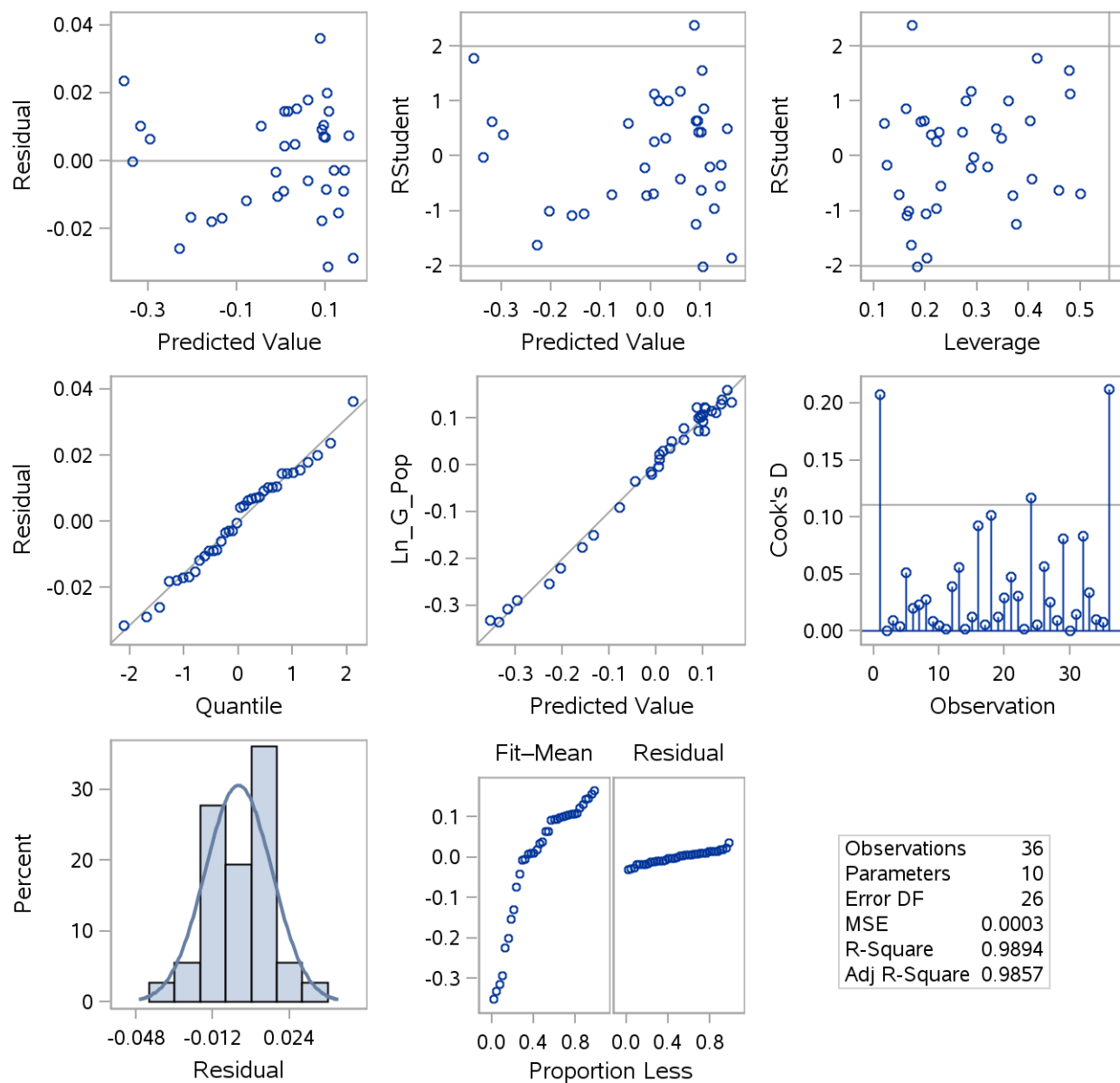
Root MSE	0.01815	R-Square	0.9894
Dependent Mean	-0.00371	Adj R-Sq	0.9857
Coeff Var	-489.38413		

Parameter Estimates					
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr >  t
Intercept	1	-10.42272	1.72961	-6.03	<.0001
Ln_pg	1	-0.53483	0.06387	-8.37	<.0001
Ln_Income	1	1.21514	0.17851	6.81	<.0001
Ln_Pnc	1	0.08313	0.20740	0.40	0.6918
Ln_Puc	1	-0.11499	0.06708	-1.71	0.0984
Ln_Pp	1	0.12063	0.08044	1.50	0.1457
Ln_Pn	1	1.21750	0.27594	4.41	0.0002
Ln_Pd	1	0.94285	0.29367	3.21	0.0035
Ln_Ps	1	-1.30667	0.37165	-3.52	0.0016
t	1	-0.00440	0.00657	-0.67	0.5095

## The SAS System

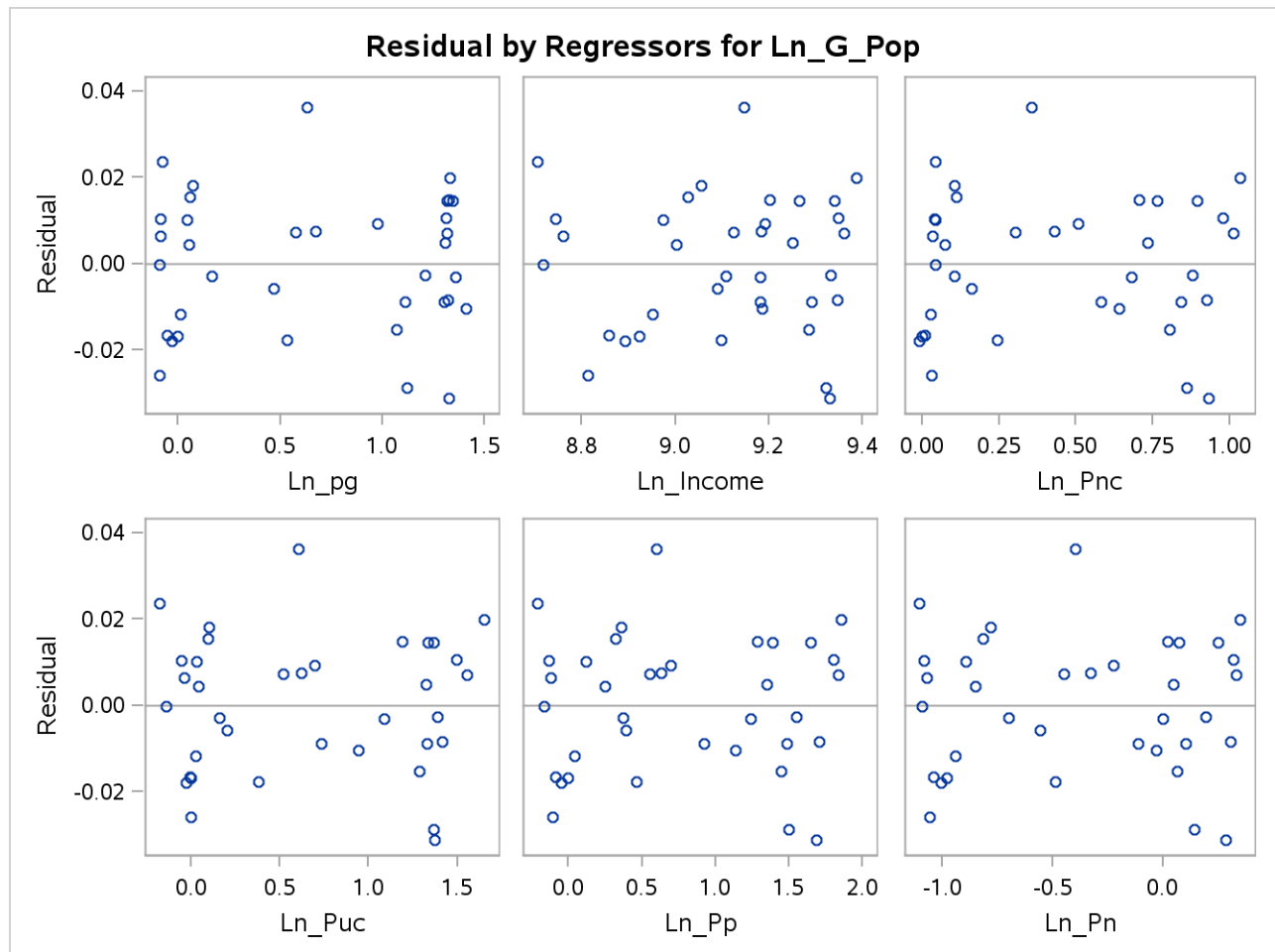
The REG Procedure  
 Model: MODEL1  
 Dependent Variable: Ln\_G\_Pop

## Fit Diagnostics for Ln\_G\_Pop



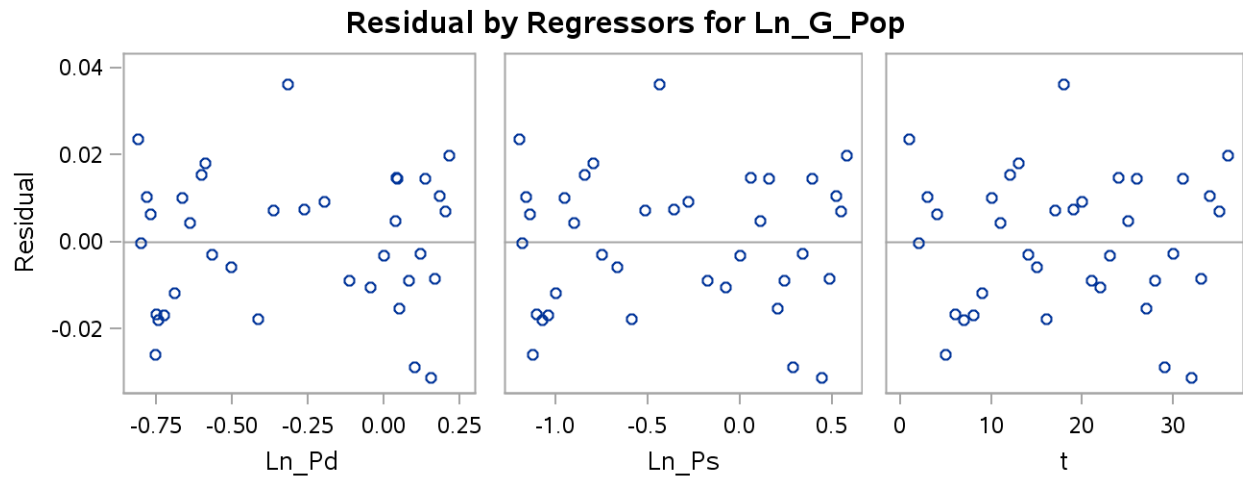
## The SAS System

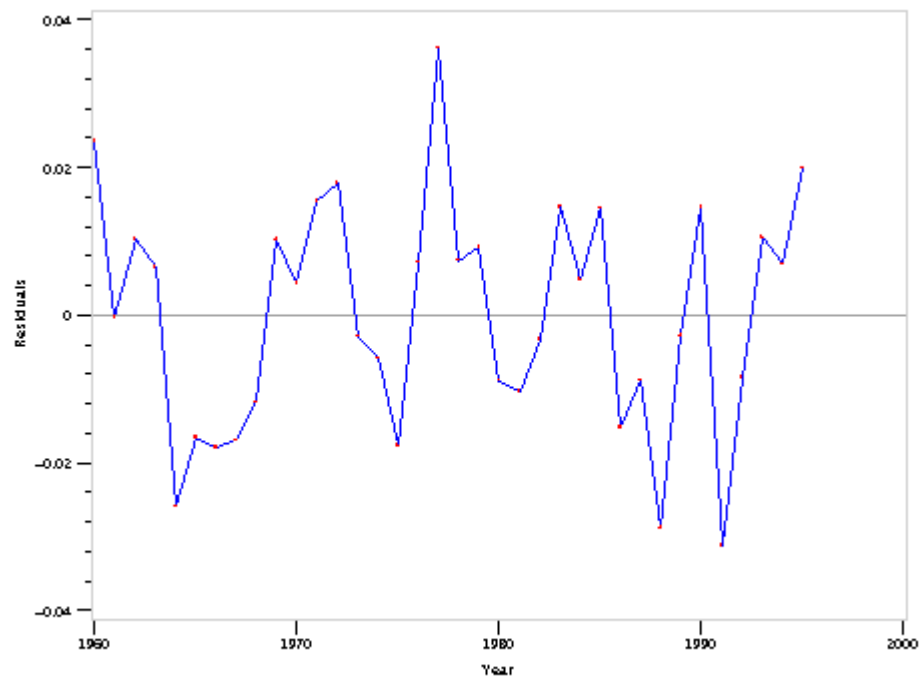
The REG Procedure  
Model: MODEL1  
Dependent Variable: Ln\_G\_Pop



**The SAS System**

**The REG Procedure**  
**Model: MODEL1**  
**Dependent Variable: Ln\_G\_Pop**



**LS Residuals versus Year**

**LS Residuals versus Year****The AUTOREG Procedure**

<b>Dependent Variable</b>	Ln_G_Pop
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## LS Residuals versus Year

### The AUTOREG Procedure

Ordinary Least Squares Estimates			
<b>SSE</b>	0.03383693	<b>DFE</b>	31
<b>MSE</b>	0.00109	<b>Root MSE</b>	0.03304
<b>SBC</b>	-130.8288	<b>AIC</b>	-138.74639
<b>MAE</b>	0.02583281	<b>AICC</b>	-136.74639
<b>MAPE</b>	55.4615141	<b>HQC</b>	-135.98294
<b>Durbin-Watson</b>	0.6047	<b>Regress R-Square</b>	0.9580
		<b>Total R-Square</b>	0.9580

Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	0.6047	<.0001	1.0000

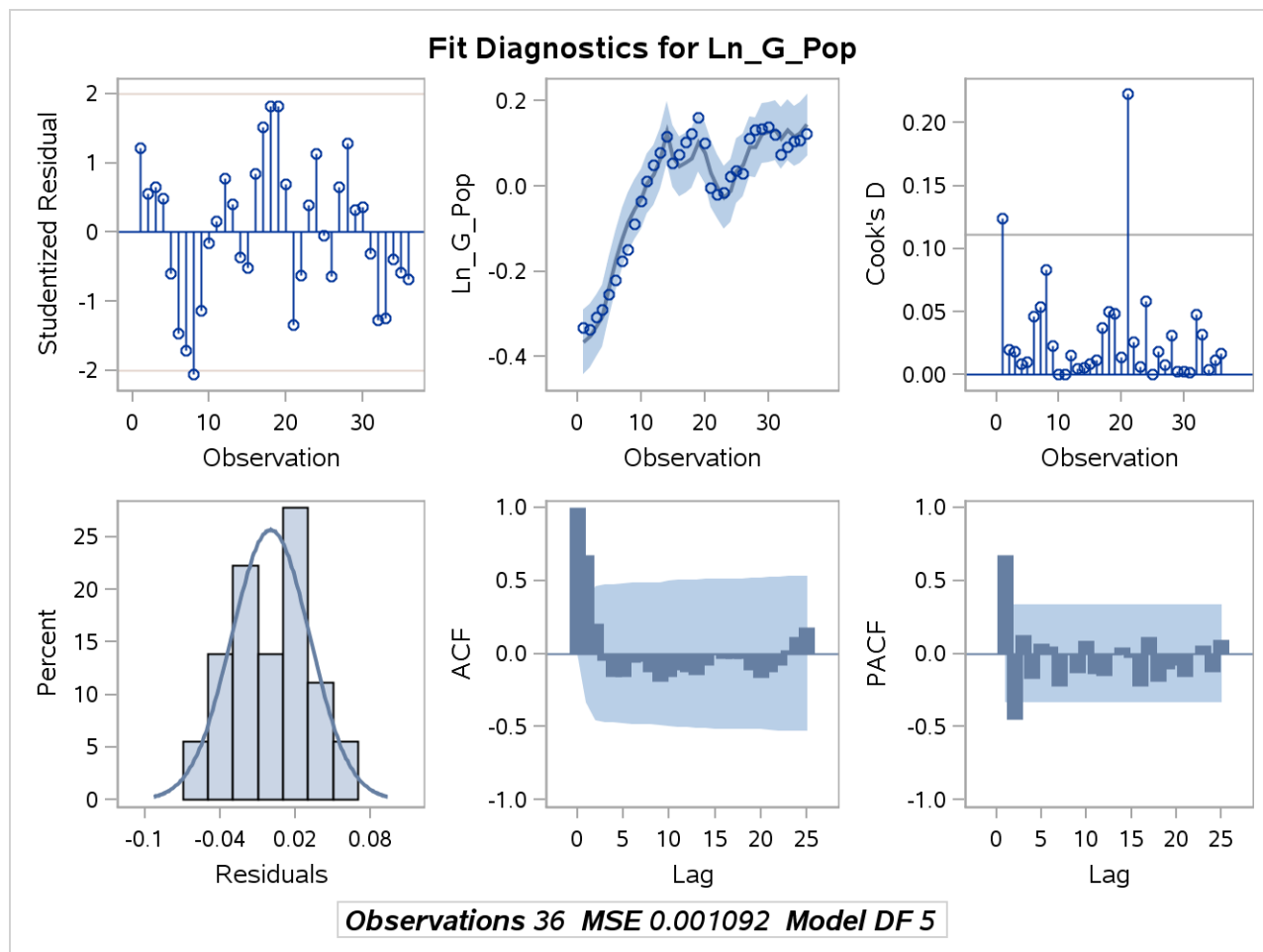
**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Godfrey's Serial Correlation Test		
Alternative	LM	Pr > LM
AR(1)	16.8354	<.0001
AR(2)	20.8247	<.0001
AR(3)	20.9943	0.0001
AR(4)	21.5360	0.0002

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
Intercept	1	-12.3418	0.6749	-18.29	<.0001
Ln_pg	1	-0.0591	0.0325	-1.82	0.0786
Ln_Income	1	1.3734	0.0756	18.16	<.0001
Ln_Pnc	1	-0.1268	0.1270	-1.00	0.3258
Ln_Puc	1	-0.1187	0.0813	-1.46	0.1545

## LS Residuals versus Year

## The AUTOREG Procedure





**LS Residuals versus Year****The AUTOREG Procedure**

<b>Dependent Variable</b>	Ln_G_Pop
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## LS Residuals versus Year

### The AUTOREG Procedure

Ordinary Least Squares Estimates			
<b>SSE</b>	0.03383693	<b>DFE</b>	31
<b>MSE</b>	0.00109	<b>Root MSE</b>	0.03304
<b>SBC</b>	-130.8288	<b>AIC</b>	-138.74639
<b>MAE</b>	0.02583281	<b>AICC</b>	-136.74639
<b>MAPE</b>	55.4615141	<b>HQC</b>	-135.98294
		<b>Regress R-Square</b>	0.9580
		<b>Total R-Square</b>	0.9580

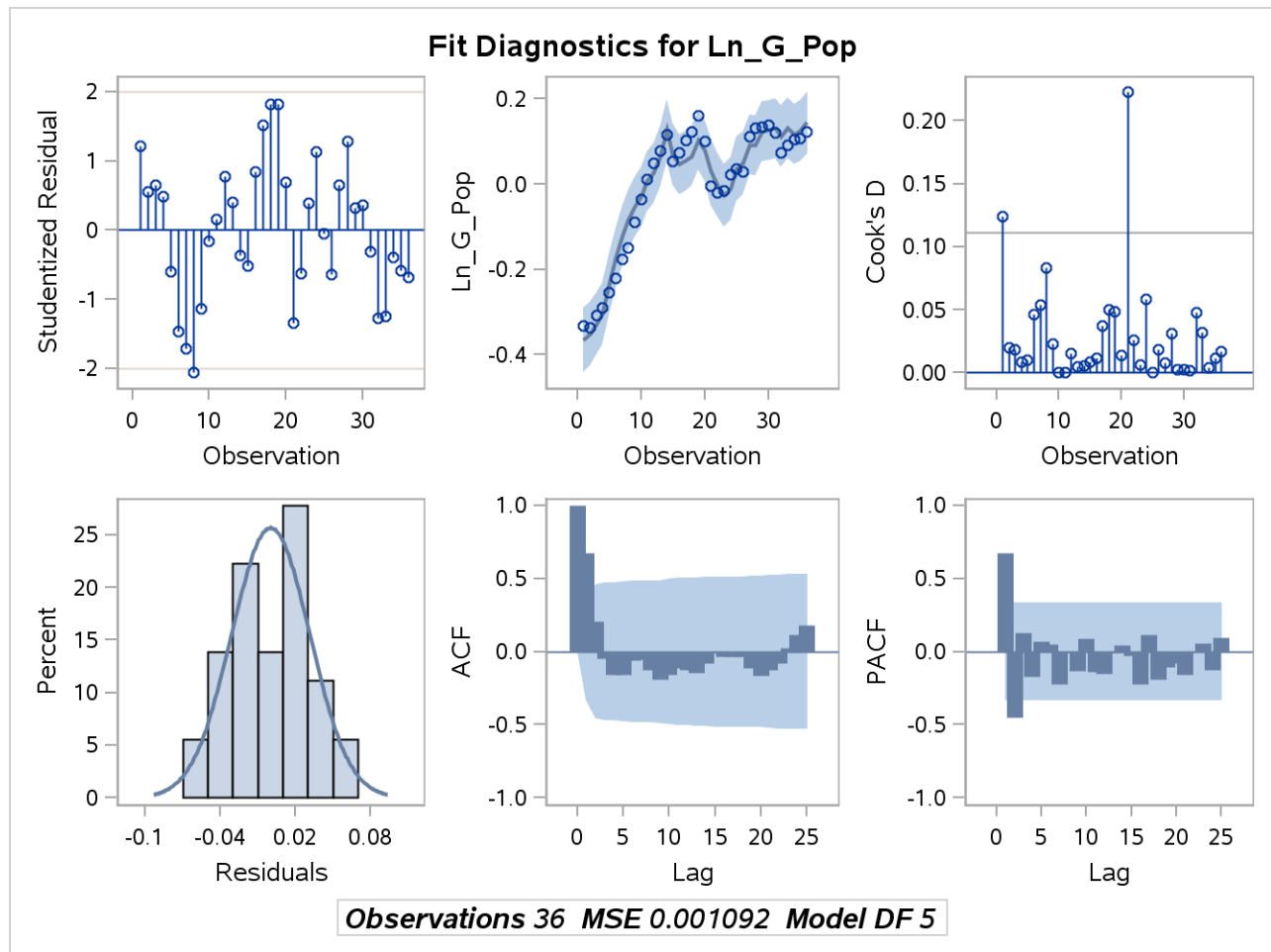
Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	0.6047	<.0001	1.0000
2	1.5218	0.0380	0.9620
3	2.0186	0.5264	0.4736
4	2.1867	0.8077	0.1923
5	2.1293	0.8251	0.1749

**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-12.3418	0.6749	-18.29	<.0001
<b>Ln_pg</b>	1	-0.0591	0.0325	-1.82	0.0786
<b>Ln_Income</b>	1	1.3734	0.0756	18.16	<.0001
<b>Ln_Pnc</b>	1	-0.1268	0.1270	-1.00	0.3258
<b>Ln_Puc</b>	1	-0.1187	0.0813	-1.46	0.1545

## LS Residuals versus Year

## The AUTOREG Procedure



**LS Residuals versus Year****The AUTOREG Procedure**

<b>Dependent Variable</b>	Ln_G_Pop
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## LS Residuals versus Year

## The AUTOREG Procedure

Ordinary Least Squares Estimates			
<b>SSE</b>	0.03383693	<b>DFE</b>	31
<b>MSE</b>	0.00109	<b>Root MSE</b>	0.03304
<b>SBC</b>	-130.8288	<b>AIC</b>	-138.74639
<b>MAE</b>	0.02583281	<b>AICC</b>	-136.74639
<b>MAPE</b>	55.4615141	<b>HQC</b>	-135.98294
<b>Durbin-Watson</b>	0.6047	<b>Regress R-Square</b>	0.9580
		<b>Total R-Square</b>	0.9580

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-12.3418	0.6749	-18.29	<.0001
<b>Ln_pg</b>	1	-0.0591	0.0325	-1.82	0.0786
<b>Ln_Income</b>	1	1.3734	0.0756	18.16	<.0001
<b>Ln_Pnc</b>	1	-0.1268	0.1270	-1.00	0.3258
<b>Ln_Puc</b>	1	-0.1187	0.0813	-1.46	0.1545

Estimates of Autocorrelations																									
Lag	Covariance	Correlation	-1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1		
0	0.000940	1.000000												*****											
1	0.000634	0.674396												*****											
2	0.000195	0.207345												****											
3	-0.00005	-0.048764												*											
4	-0.00015	-0.158770												***											
5	-0.00015	-0.158297												***											

<b>Preliminary MSE</b>	0.000387
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Estimates of Autoregressive Parameters			
Lag	Coefficient	Standard Error	t Value
<b>1</b>	-1.070760	0.195615	-5.47
<b>2</b>	0.696513	0.282882	2.46
<b>3</b>	-0.350495	0.306522	-1.14
<b>4</b>	0.246682	0.282882	0.87
<b>5</b>	-0.071431	0.195615	-0.37

## LS Residuals versus Year

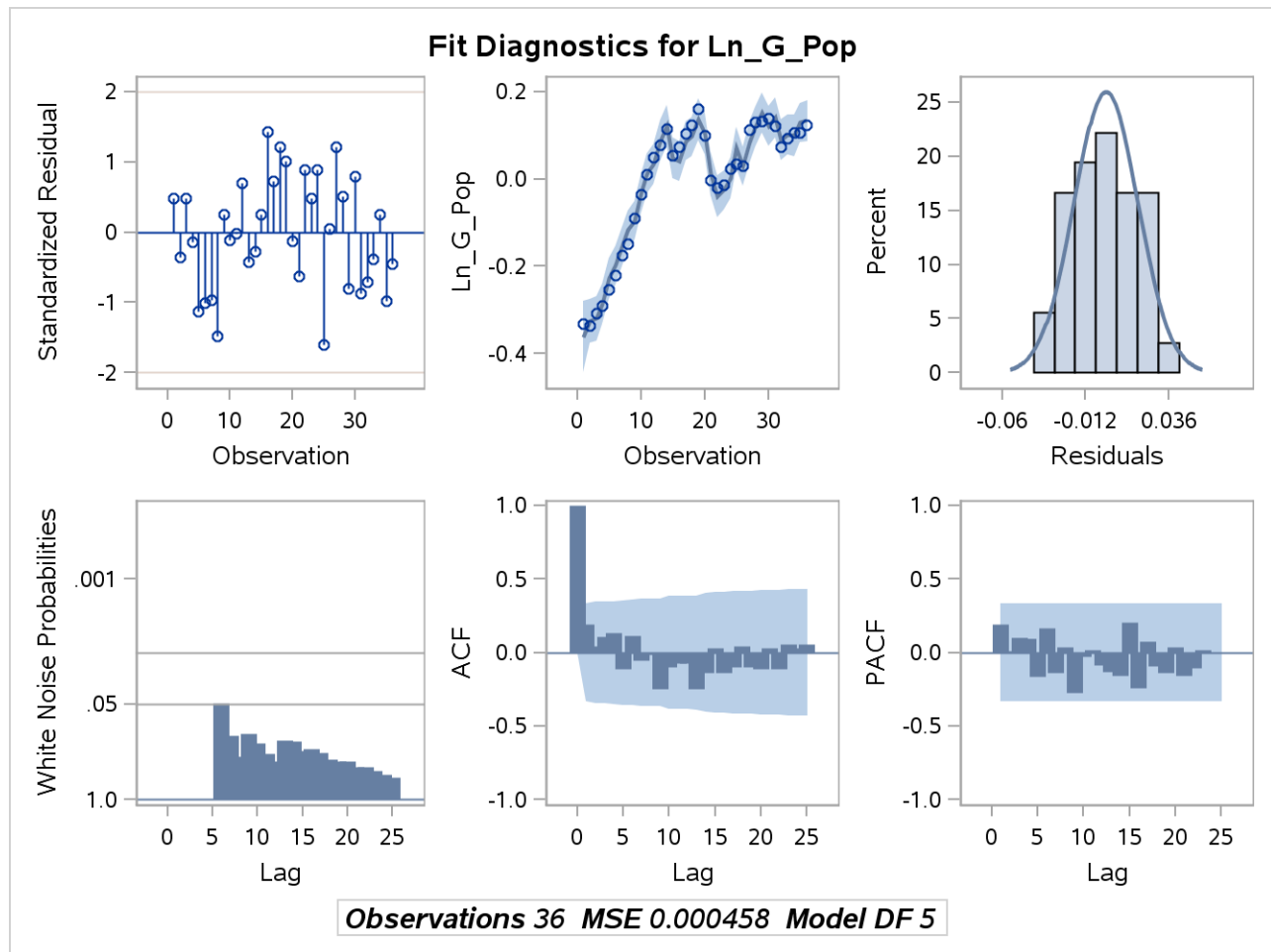
## The AUTOREG Procedure

Yule-Walker Estimates			
<b>SSE</b>	0.01190221	<b>DFE</b>	26
<b>MSE</b>	0.0004578	<b>Root MSE</b>	0.02140
<b>SBC</b>	-149.26548	<b>AIC</b>	-165.10067
<b>MAE</b>	0.0155212	<b>AICC</b>	-156.30067
<b>MAPE</b>	32.4077485	<b>HQC</b>	-159.57376
<b>Durbin-Watson</b>	1.7003	<b>Regress R-Square</b>	0.9333
		<b>Total R-Square</b>	0.9852

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-11.8274	0.9086	-13.02	<.0001
<b>Ln_pg</b>	1	-0.0828	0.0366	-2.26	0.0323
<b>Ln_Income</b>	1	1.3162	0.1019	12.92	<.0001
<b>Ln_Pnc</b>	1	-0.1806	0.1340	-1.35	0.1893
<b>Ln_Puc</b>	1	-0.0482	0.0849	-0.57	0.5754

## LS Residuals versus Year

## The AUTOREG Procedure



**LS Residuals versus Year****The AUTOREG Procedure**

<b>Dependent Variable</b>	Ln_G_Pop
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## LS Residuals versus Year

## The AUTOREG Procedure

Ordinary Least Squares Estimates			
<b>SSE</b>	0.03383693	<b>DFE</b>	31
<b>MSE</b>	0.00109	<b>Root MSE</b>	0.03304
<b>SBC</b>	-130.8288	<b>AIC</b>	-138.74639
<b>MAE</b>	0.02583281	<b>AICC</b>	-136.74639
<b>MAPE</b>	55.4615141	<b>HQC</b>	-135.98294
<b>Durbin-Watson</b>	0.6047	<b>Regress R-Square</b>	0.9580
		<b>Total R-Square</b>	0.9580

Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	0.6047	<.0001	1.0000

**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
Intercept	1	-12.3418	0.6749	-18.29	<.0001
Ln_pg	1	-0.0591	0.0325	-1.82	0.0786
Ln_Income	1	1.3734	0.0756	18.16	<.0001
Ln_Pnc	1	-0.1268	0.1270	-1.00	0.3258
Ln_Puc	1	-0.1187	0.0813	-1.46	0.1545

Estimates of Autocorrelations																								
Lag	Covariance	Correlation	-1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1	
0	0.000940	1.000000													*****									
1	0.000634	0.674396													*****									

**Preliminary MSE** 0.000512

Estimates of Autoregressive Parameters			
Lag	Coefficient	Standard Error	t Value
1	-0.674396	0.134807	-5.00

## LS Residuals versus Year

### The AUTOREG Procedure

Yule-Walker Estimates			
<b>SSE</b>	0.01445368	<b>DFE</b>	30
<b>MSE</b>	0.0004818	<b>Root MSE</b>	0.02195
<b>SBC</b>	-157.26039	<b>AIC</b>	-166.76151
<b>MAE</b>	0.01741161	<b>AICC</b>	-163.86496
<b>MAPE</b>	42.8645106	<b>HQC</b>	-163.44536
<b>Durbin-Watson</b>	1.1161	<b>Regress R-Square</b>	0.9019
		<b>Total R-Square</b>	0.9821

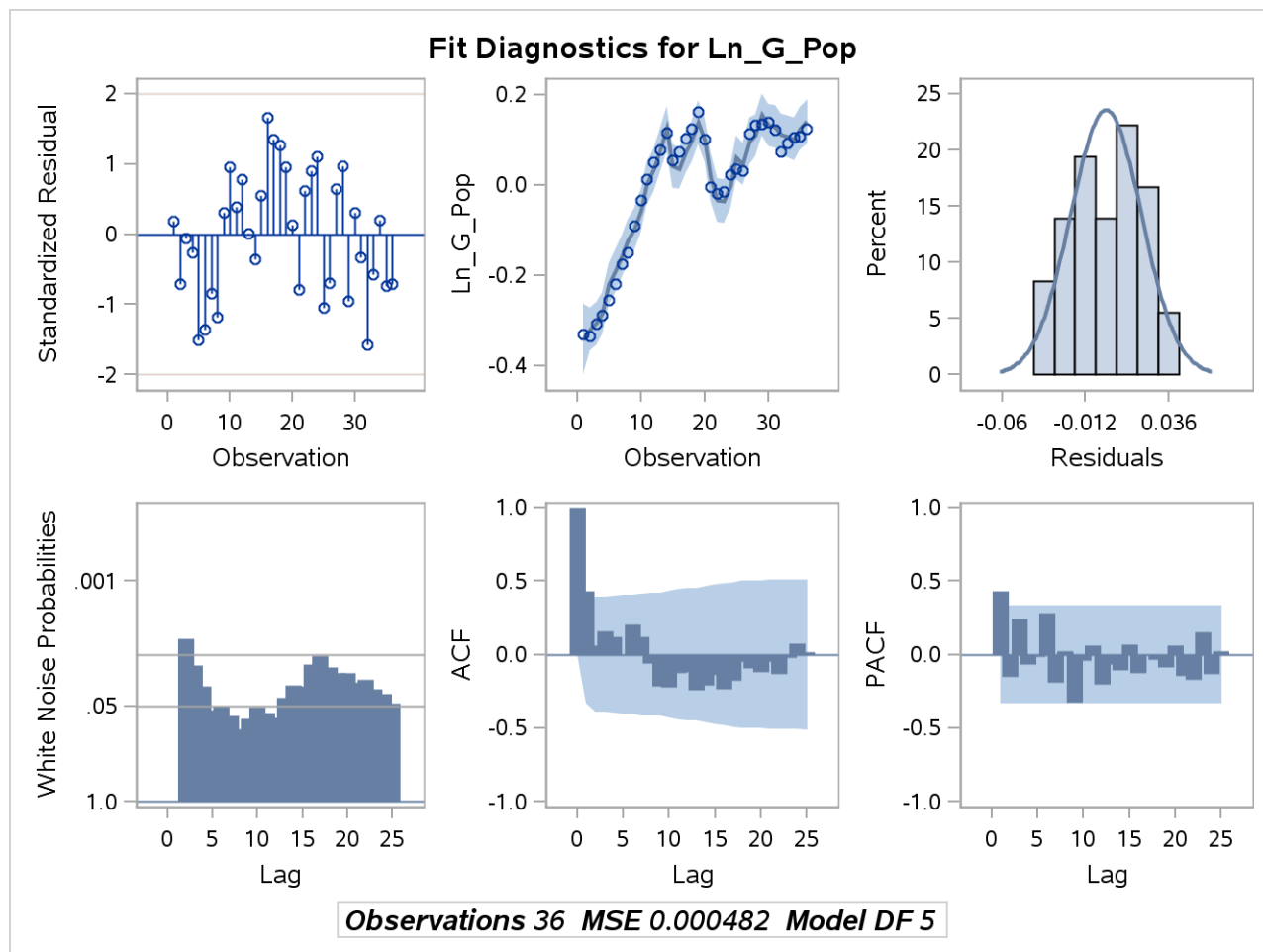
Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	1.1161	0.0006	0.9994

**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-11.4907	0.9546	-12.04	<.0001
<b>Ln_pg</b>	1	-0.1464	0.0377	-3.88	0.0005
<b>Ln_Income</b>	1	1.2783	0.1072	11.93	<.0001
<b>Ln_Pnc</b>	1	-0.0399	0.1297	-0.31	0.7607
<b>Ln_Puc</b>	1	-0.0669	0.0779	-0.86	0.3970

## LS Residuals versus Year

## The AUTOREG Procedure



**LS Residuals versus Year****The AUTOREG Procedure**

<b>Dependent Variable</b>	Ln_G_Pop
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## LS Residuals versus Year

## The AUTOREG Procedure

Ordinary Least Squares Estimates			
<b>SSE</b>	0.03383693	<b>DFE</b>	31
<b>MSE</b>	0.00109	<b>Root MSE</b>	0.03304
<b>SBC</b>	-130.8288	<b>AIC</b>	-138.74639
<b>MAE</b>	0.02583281	<b>AICC</b>	-136.74639
<b>MAPE</b>	55.4615141	<b>HQC</b>	-135.98294
		<b>Regress R-Square</b>	0.9580
		<b>Total R-Square</b>	0.9580

Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	0.6047	<.0001	1.0000
2	1.5218	0.0380	0.9620

**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-12.3418	0.6749	-18.29	<.0001
<b>Ln_pg</b>	1	-0.0591	0.0325	-1.82	0.0786
<b>Ln_Income</b>	1	1.3734	0.0756	18.16	<.0001
<b>Ln_Pnc</b>	1	-0.1268	0.1270	-1.00	0.3258
<b>Ln_Puc</b>	1	-0.1187	0.0813	-1.46	0.1545

Estimates of Autocorrelations																		
Lag	Covariance	Correlation	-1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5
0	0.000940	1.000000													*****			
1	0.000634	0.674396													*****			
2	0.000195	0.207345													****			

**Preliminary MSE** 0.000407

Estimates of Autoregressive Parameters			
Lag	Coefficient	Standard Error	t Value
1	-0.980509	0.165464	-5.93
2	0.453907	0.165464	2.74

## LS Residuals versus Year

### The AUTOREG Procedure

Yule-Walker Estimates			
<b>SSE</b>	0.01320984	<b>DFE</b>	29
<b>MSE</b>	0.0004555	<b>Root MSE</b>	0.02134
<b>SBC</b>	-156.45499	<b>AIC</b>	-167.53962
<b>MAE</b>	0.01630594	<b>AICC</b>	-163.53962
<b>MAPE</b>	39.5411131	<b>HQC</b>	-163.67078
		<b>Regress R-Square</b>	0.9312
		<b>Total R-Square</b>	0.9836

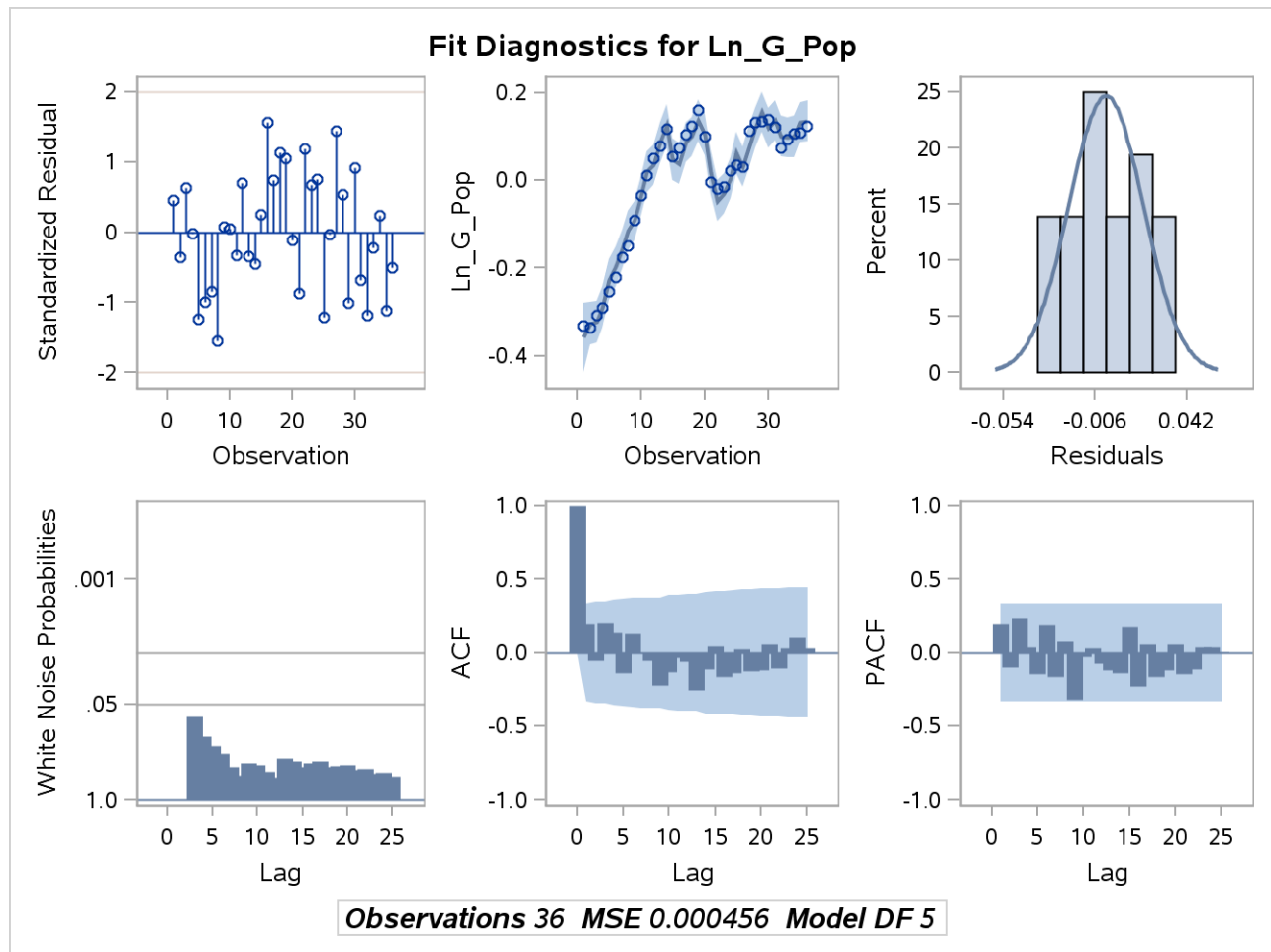
Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	1.6395	0.0881	0.9119
2	1.9592	0.3675	0.6325

**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-12.1071	0.8999	-13.45	<.0001
<b>Ln_pg</b>	1	-0.0851	0.0373	-2.28	0.0299
<b>Ln_Income</b>	1	1.3473	0.1009	13.36	<.0001
<b>Ln_Pnc</b>	1	-0.1073	0.1381	-0.78	0.4433
<b>Ln_Puc</b>	1	-0.1002	0.0887	-1.13	0.2677

## LS Residuals versus Year

## The AUTOREG Procedure



**LS Residuals versus Year****The AUTOREG Procedure**

<b>Dependent Variable</b>	Ln_G_Pop
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## LS Residuals versus Year

## The AUTOREG Procedure

Ordinary Least Squares Estimates			
<b>SSE</b>	0.03383693	<b>DFE</b>	31
<b>MSE</b>	0.00109	<b>Root MSE</b>	0.03304
<b>SBC</b>	-130.8288	<b>AIC</b>	-138.74639
<b>MAE</b>	0.02583281	<b>AICC</b>	-136.74639
<b>MAPE</b>	55.4615141	<b>HQC</b>	-135.98294
<b>Durbin-Watson</b>	0.6047	<b>Regress R-Square</b>	0.9580
		<b>Total R-Square</b>	0.9580

Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	0.6047	<.0001	1.0000

**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
Intercept	1	-12.3418	0.6749	-18.29	<.0001
Ln_pg	1	-0.0591	0.0325	-1.82	0.0786
Ln_Income	1	1.3734	0.0756	18.16	<.0001
Ln_Pnc	1	-0.1268	0.1270	-1.00	0.3258
Ln_Puc	1	-0.1187	0.0813	-1.46	0.1545

Estimates of Autocorrelations																								
Lag	Covariance	Correlation	-1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1	
0	0.000940	1.000000													*****									
1	0.000634	0.674396													*****									

**Preliminary MSE** 0.000512

Estimates of Autoregressive Parameters			
Lag	Coefficient	Standard Error	t Value
1	-0.674396	0.134807	-5.00

Algorithm converged.

## LS Residuals versus Year

## The AUTOREG Procedure

Maximum Likelihood Estimates			
<b>SSE</b>	0.01114098	<b>DFE</b>	30
<b>MSE</b>	0.0003714	<b>Root MSE</b>	0.01927
<b>SBC</b>	-165.23445	<b>AIC</b>	-174.73556
<b>MAE</b>	0.01399752	<b>AICC</b>	-171.83901
<b>MAPE</b>	40.4938836	<b>HQC</b>	-171.41942
<b>Log Likelihood</b>	93.3677825	<b>Regress R-Square</b>	0.8147
<b>Durbin-Watson</b>	1.4476	<b>Total R-Square</b>	0.9862
		<b>Observations</b>	36

Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	1.4476	0.0192	0.9808

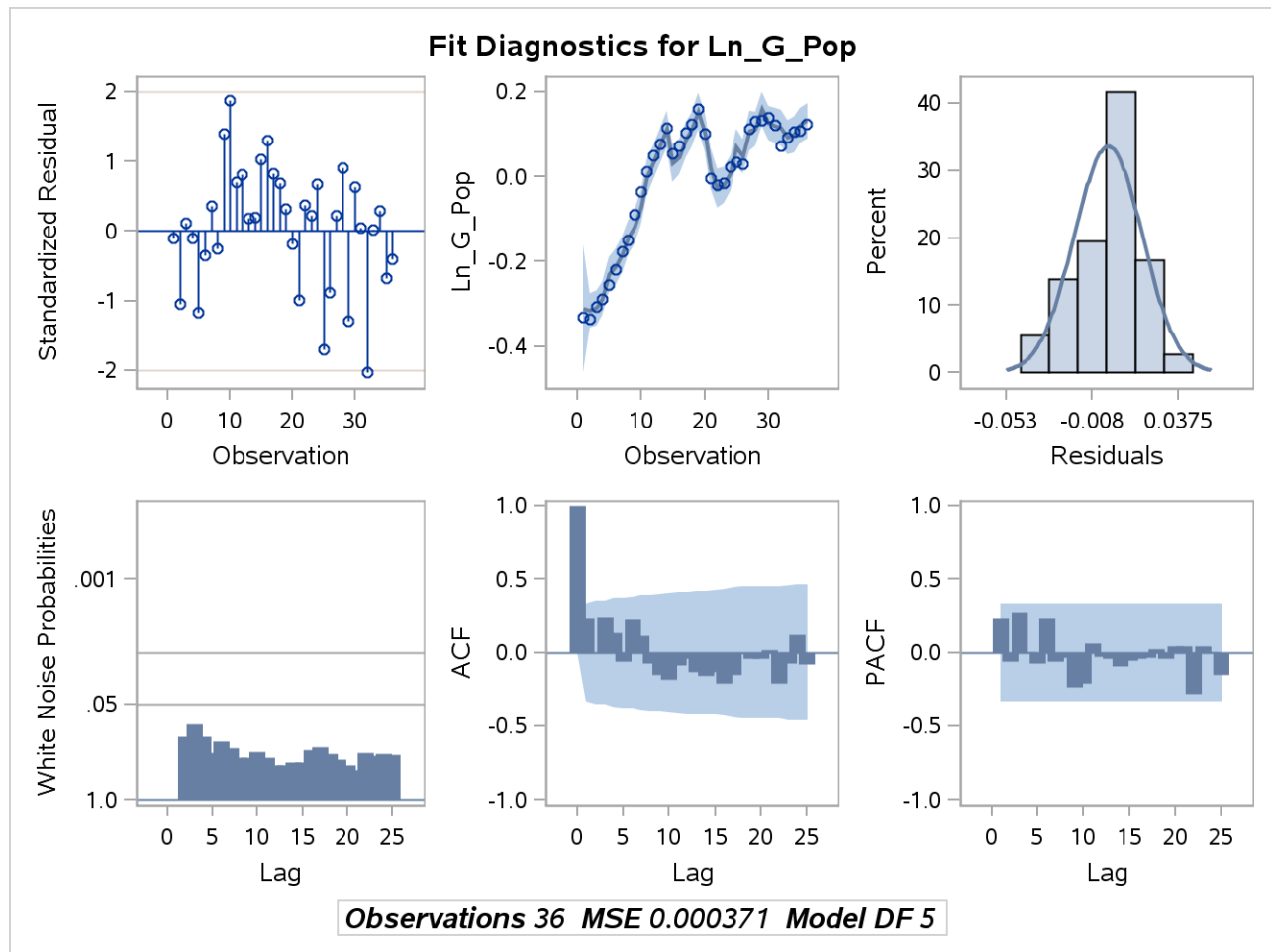
**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-9.7543	1.1530	-8.46	<.0001
<b>Ln_pg</b>	1	-0.2081	0.0368	-5.66	<.0001
<b>Ln_Income</b>	1	1.0817	0.1295	8.35	<.0001
<b>Ln_Pnc</b>	1	0.0886	0.1333	0.66	0.5114
<b>Ln_Puc</b>	1	-0.0349	0.0669	-0.52	0.6054
<b>AR1</b>	1	-0.9302	0.0849	-10.95	<.0001

Autoregressive parameters assumed given					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-9.7543	1.1523	-8.46	<.0001
<b>Ln_pg</b>	1	-0.2081	0.0355	-5.87	<.0001
<b>Ln_Income</b>	1	1.0817	0.1294	8.36	<.0001
<b>Ln_Pnc</b>	1	0.0886	0.1268	0.70	0.4903
<b>Ln_Puc</b>	1	-0.0349	0.0669	-0.52	0.6053

## LS Residuals versus Year

## The AUTOREG Procedure



**LS Residuals versus Year****The AUTOREG Procedure**

<b>Dependent Variable</b>	Ln_G_Pop
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## LS Residuals versus Year

## The AUTOREG Procedure

Ordinary Least Squares Estimates			
<b>SSE</b>	0.03383693	<b>DFE</b>	31
<b>MSE</b>	0.00109	<b>Root MSE</b>	0.03304
<b>SBC</b>	-130.8288	<b>AIC</b>	-138.74639
<b>MAE</b>	0.02583281	<b>AICC</b>	-136.74639
<b>MAPE</b>	55.4615141	<b>HQC</b>	-135.98294
		<b>Regress R-Square</b>	0.9580
		<b>Total R-Square</b>	0.9580

Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	0.6047	<.0001	1.0000
2	1.5218	0.0380	0.9620

**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-12.3418	0.6749	-18.29	<.0001
<b>Ln_pg</b>	1	-0.0591	0.0325	-1.82	0.0786
<b>Ln_Income</b>	1	1.3734	0.0756	18.16	<.0001
<b>Ln_Pnc</b>	1	-0.1268	0.1270	-1.00	0.3258
<b>Ln_Puc</b>	1	-0.1187	0.0813	-1.46	0.1545

Estimates of Autocorrelations													
Lag	Covariance	Correlation	-1	9	8	7	6	5	4	3	2	1	0
0	0.000940	1.000000											*****
1	0.000634	0.674396											*****
2	0.000195	0.207345											****

**Preliminary MSE** 0.000407

Estimates of Autoregressive Parameters			
Lag	Coefficient	Standard Error	t Value
1	-0.980509	0.165464	-5.93
2	0.453907	0.165464	2.74

Algorithm converged.

## LS Residuals versus Year

## The AUTOREG Procedure

Maximum Likelihood Estimates			
<b>SSE</b>	0.01046072	<b>DFE</b>	29
<b>MSE</b>	0.0003607	<b>Root MSE</b>	0.01899
<b>SBC</b>	-163.75377	<b>AIC</b>	-174.83841
<b>MAE</b>	0.01384845	<b>AICC</b>	-170.83841
<b>MAPE</b>	35.3182689	<b>HQC</b>	-170.96957
<b>Log Likelihood</b>	94.4192028	<b>Regress R-Square</b>	0.7964
		<b>Total R-Square</b>	0.9870
		<b>Observations</b>	36

Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	1.7946	0.1982	0.8018
2	2.1241	0.6270	0.3730

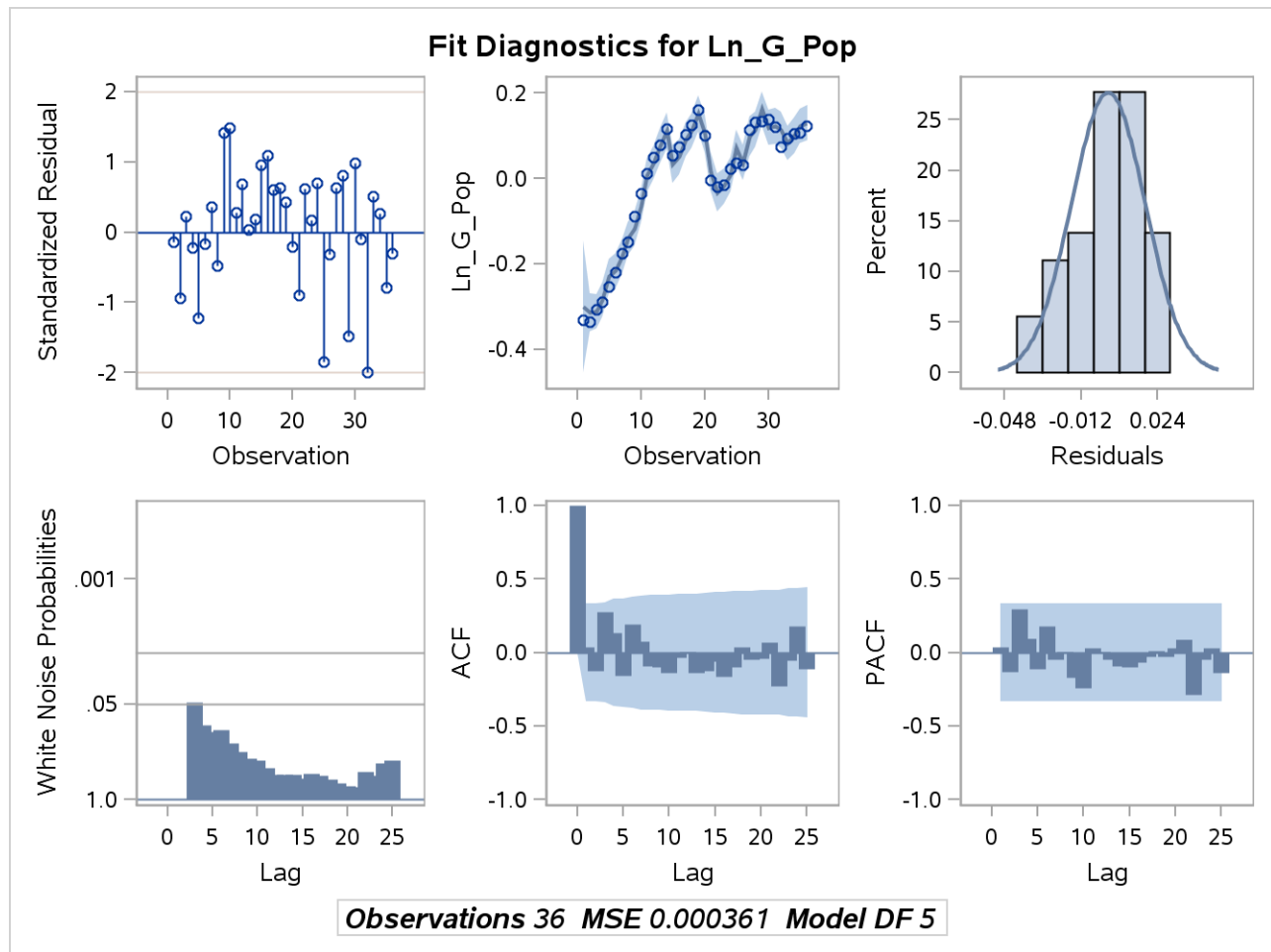
**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-9.4684	1.3184	-7.18	<.0001
<b>Ln_pg</b>	1	-0.2000	0.0389	-5.15	<.0001
<b>Ln_Income</b>	1	1.0507	0.1481	7.09	<.0001
<b>Ln_Pnc</b>	1	0.0528	0.1360	0.39	0.7004
<b>Ln_Puc</b>	1	-0.0144	0.0739	-0.20	0.8467
<b>AR1</b>	1	-1.1680	0.1844	-6.33	<.0001
<b>AR2</b>	1	0.2525	0.1943	1.30	0.2041

Autoregressive parameters assumed given					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-9.4684	1.2905	-7.34	<.0001
<b>Ln_pg</b>	1	-0.2000	0.0369	-5.42	<.0001
<b>Ln_Income</b>	1	1.0507	0.1448	7.25	<.0001
<b>Ln_Pnc</b>	1	0.0528	0.1320	0.40	0.6919
<b>Ln_Puc</b>	1	-0.0144	0.0724	-0.20	0.8436

## LS Residuals versus Year

## The AUTOREG Procedure



**LS Residuals versus Year****The AUTOREG Procedure**

<b>Dependent Variable</b>	Ln_G_Pop
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## LS Residuals versus Year

## The AUTOREG Procedure

Ordinary Least Squares Estimates			
<b>SSE</b>	0.03383693	<b>DFE</b>	31
<b>MSE</b>	0.00109	<b>Root MSE</b>	0.03304
<b>SBC</b>	-130.8288	<b>AIC</b>	-138.74639
<b>MAE</b>	0.02583281	<b>AICC</b>	-136.74639
<b>MAPE</b>	55.4615141	<b>HQC</b>	-135.98294
<b>Durbin-Watson</b>	0.6047	<b>Regress R-Square</b>	0.9580
		<b>Total R-Square</b>	0.9580

Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	0.6047	<.0001	1.0000

**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
Intercept	1	-12.3418	0.6749	-18.29	<.0001
Ln_pg	1	-0.0591	0.0325	-1.82	0.0786
Ln_Income	1	1.3734	0.0756	18.16	<.0001
Ln_Pnc	1	-0.1268	0.1270	-1.00	0.3258
Ln_Puc	1	-0.1187	0.0813	-1.46	0.1545

Estimates of Autocorrelations																								
Lag	Covariance	Correlation	-1	9	8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8	9	1	
0	0.000940	1.000000													*****									
1	0.000634	0.674396													*****									

Preliminary MSE 0.000512

Estimates of Autoregressive Parameters			
Lag	Coefficient	Standard Error	t Value
1	-0.674396	0.134807	-5.00

Algorithm converged.

## LS Residuals versus Year

## The AUTOREG Procedure

Yule-Walker Estimates			
<b>SSE</b>	0.01109861	<b>DFE</b>	30
<b>MSE</b>	0.0003700	<b>Root MSE</b>	0.01923
<b>SBC</b>	-165.18254	<b>AIC</b>	-174.68366
<b>MAE</b>	0.01383977	<b>AICC</b>	-171.78711
<b>MAPE</b>	40.701424	<b>HQC</b>	-171.36752
<b>Durbin-Watson</b>	1.4670	<b>Regress R-Square</b>	0.8093
		<b>Total R-Square</b>	0.9862

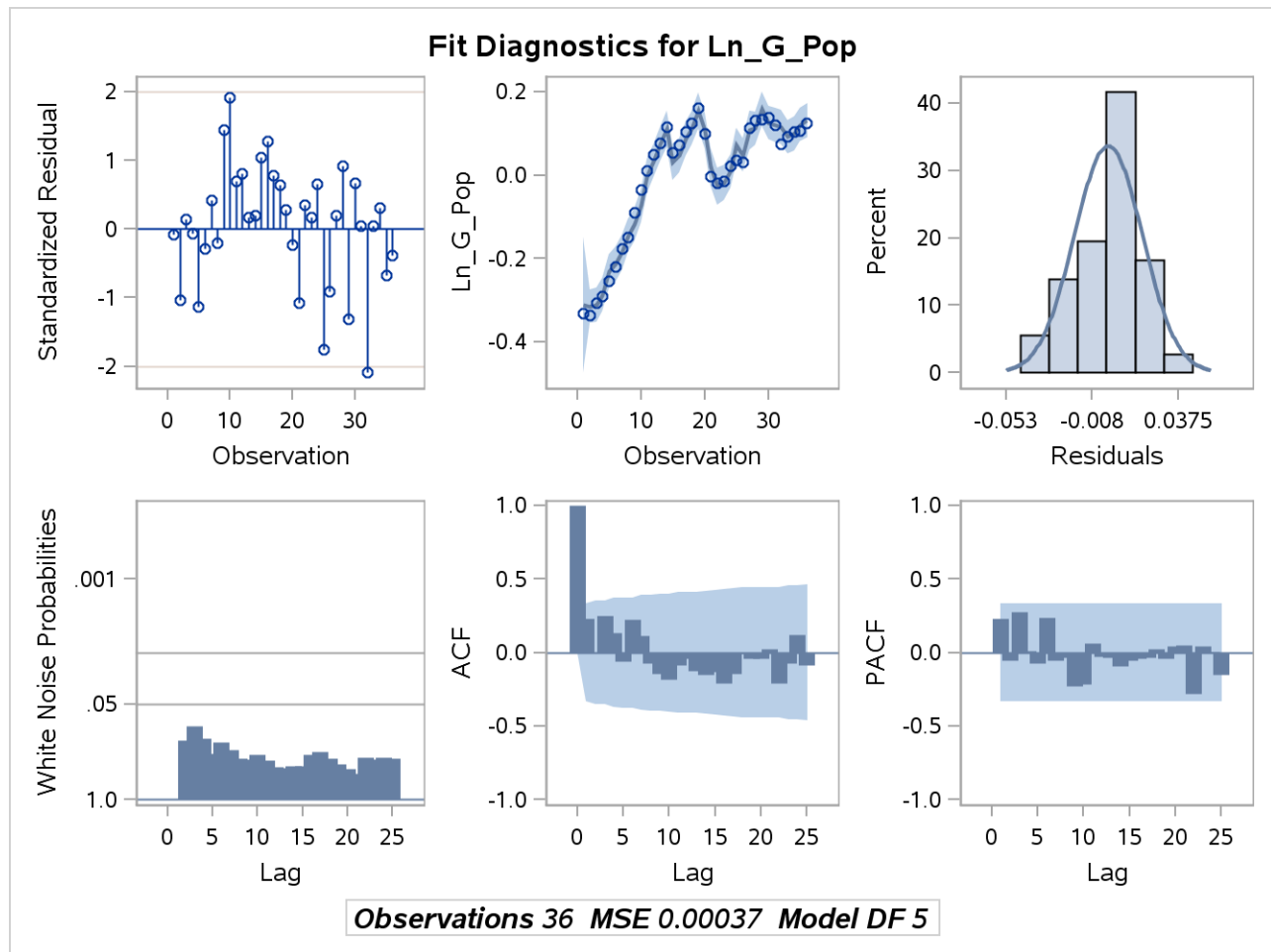
Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	1.4670	0.0226	0.9774

**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-9.6703	1.1670	-8.29	<.0001
<b>Ln_pg</b>	1	-0.2101	0.0354	-5.94	<.0001
<b>Ln_Income</b>	1	1.0720	0.1309	8.19	<.0001
<b>Ln_Pnc</b>	1	0.0938	0.1273	0.74	0.4670
<b>Ln_Puc</b>	1	-0.0341	0.0665	-0.51	0.6113

## LS Residuals versus Year

## The AUTOREG Procedure



**LS Residuals versus Year****The AUTOREG Procedure**

<b>Dependent Variable</b>	Ln_G_Pop
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## LS Residuals versus Year

## The AUTOREG Procedure

Ordinary Least Squares Estimates			
<b>SSE</b>	0.03383693	<b>DFE</b>	31
<b>MSE</b>	0.00109	<b>Root MSE</b>	0.03304
<b>SBC</b>	-130.8288	<b>AIC</b>	-138.74639
<b>MAE</b>	0.02583281	<b>AICC</b>	-136.74639
<b>MAPE</b>	55.4615141	<b>HQC</b>	-135.98294
		<b>Regress R-Square</b>	0.9580
		<b>Total R-Square</b>	0.9580

Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	0.6047	<.0001	1.0000
2	1.5218	0.0380	0.9620

**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-12.3418	0.6749	-18.29	<.0001
<b>Ln_pg</b>	1	-0.0591	0.0325	-1.82	0.0786
<b>Ln_Income</b>	1	1.3734	0.0756	18.16	<.0001
<b>Ln_Pnc</b>	1	-0.1268	0.1270	-1.00	0.3258
<b>Ln_Puc</b>	1	-0.1187	0.0813	-1.46	0.1545

Estimates of Autocorrelations													
Lag	Covariance	Correlation	-1	9	8	7	6	5	4	3	2	1	0
0	0.000940	1.000000											*****
1	0.000634	0.674396											*****
2	0.000195	0.207345											****

Preliminary MSE 0.000407

Estimates of Autoregressive Parameters			
Lag	Coefficient	Standard Error	t Value
1	-0.980509	0.165464	-5.93
2	0.453907	0.165464	2.74

Algorithm converged.

## LS Residuals versus Year

### The AUTOREG Procedure

Yule-Walker Estimates			
<b>SSE</b>	0.01047934	<b>DFE</b>	29
<b>MSE</b>	0.0003614	<b>Root MSE</b>	0.01901
<b>SBC</b>	-163.74728	<b>AIC</b>	-174.83192
<b>MAE</b>	0.01389843	<b>AICC</b>	-170.83192
<b>MAPE</b>	35.420998	<b>HQC</b>	-170.96308
		<b>Regress R-Square</b>	0.7992
		<b>Total R-Square</b>	0.9870

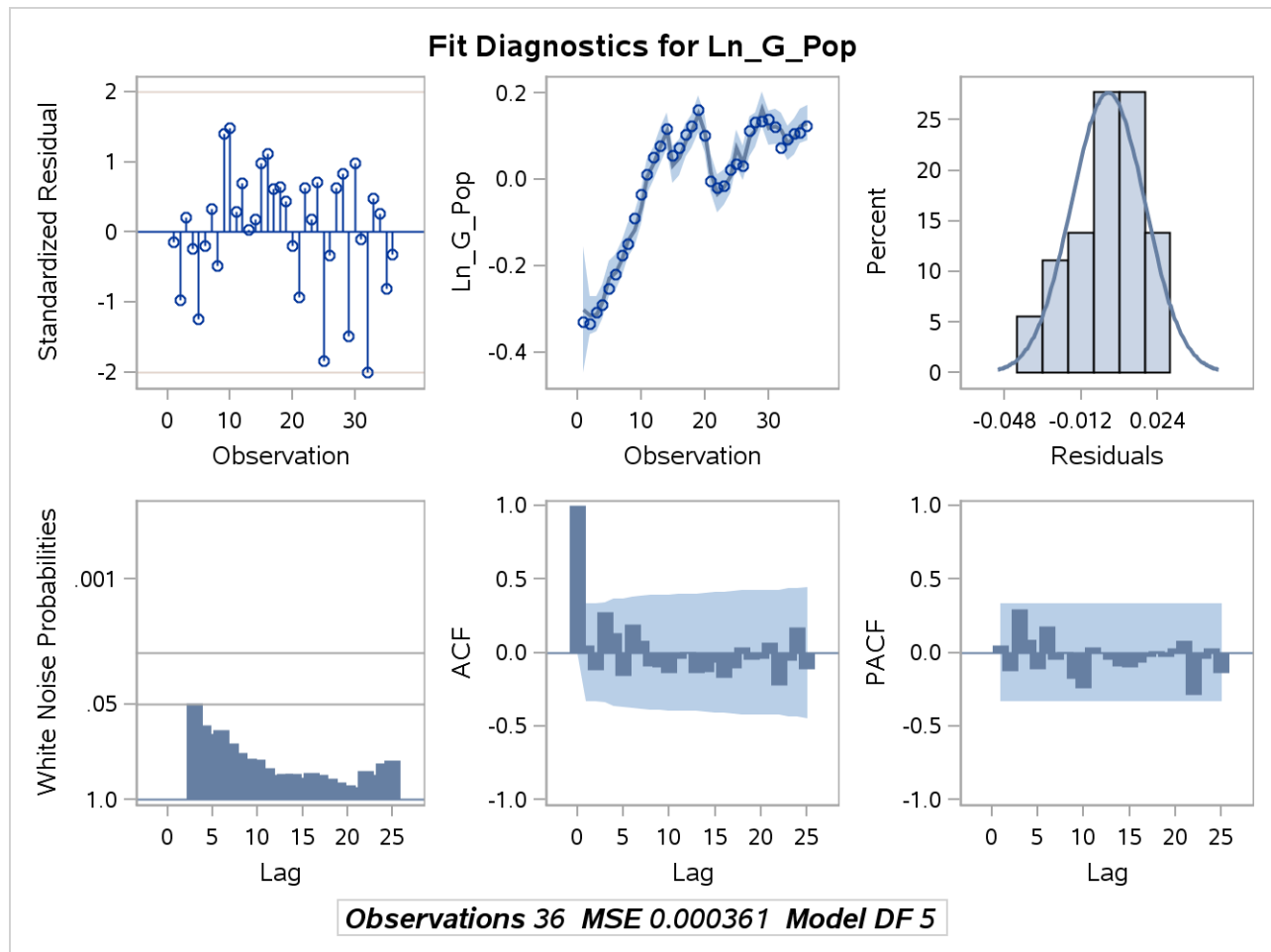
Durbin-Watson Statistics			
Order	DW	Pr < DW	Pr > DW
1	1.7806	0.1852	0.8148
2	2.1161	0.6169	0.3831

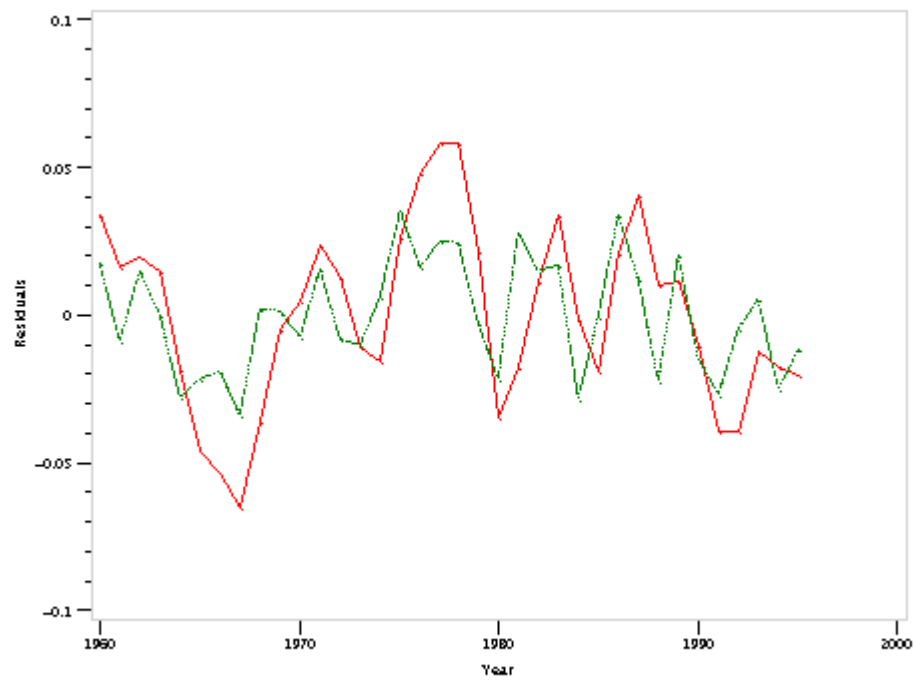
**Note:** Pr<DW is the p-value for testing positive autocorrelation, and Pr>DW is the p-value for testing negative autocorrelation.

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Approx Pr >  t
<b>Intercept</b>	1	-9.5153	1.2816	-7.42	<.0001
<b>Ln_pg</b>	1	-0.1993	0.0370	-5.39	<.0001
<b>Ln_Income</b>	1	1.0559	0.1439	7.34	<.0001
<b>Ln_Pnc</b>	1	0.0525	0.1318	0.40	0.6935
<b>Ln_Puc</b>	1	-0.0156	0.0725	-0.22	0.8310

## LS Residuals versus Year

## The AUTOREG Procedure



**LS Residuals versus Year**



**Comparing the residuals from the AR(1)--AR(5) models**