

## LAMPIRAN 1

### 1. Uji Integrasi

#### a. Uji Unit Root Variabel HGD Tingkat Level

Null Hypothesis: HGD has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.276843	0.9978
Test critical values:		
1% level	-3.689194	
5% level	-2.971853	
10% level	-2.625121	

\*Mackinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(HGD)

Method: Least Squares

Date: 05/19/16 Time: 20:36

Sample (adjusted): 1987 2014

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HGD(-1)	0.074163	0.058083	1.276843	0.2134
D(HGD(-1))	-0.435261	0.199827	-2.178185	0.0390
C	208.3445	302.7247	0.688231	0.4976

R-squared	0.164709	Mean dependent var	389.3293
Adjusted R-squared	0.097886	S.D. dependent var	930.8805
S.E. of regression	884.1473	Akaike info criterion	16.50808
Sum squared resid	19542913	Schwarz criterion	16.65082
Log likelihood	-228.1131	Hannan-Quinn criter.	16.55172
F-statistic	2.464850	Durbin-Watson stat	1.999537
Prob(F-statistic)	0.105432		

## b. Uji Unit Root Variabel KURS Tingkat Level

Null Hypothesis: KURS has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.196620	0.9283
Test critical values:		
1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

\*Mackinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(KURS)  
 Method: Least Squares  
 Date: 05/19/16 Time: 20:53  
 Sample (adjusted): 1986 2014  
 Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
KURS(-1)	-0.011444	0.058201	-0.196620	0.8456
C	507.0878	418.5379	1.211570	0.2362
R-squared	0.001430	Mean dependent var		436.8879
Adjusted R-squared	-0.035554	S.D. dependent var		1155.785
S.E. of regression	1176.152	Akaike info criterion		17.04436
Sum squared resid	37350020	Schwarz criterion		17.13865
Log likelihood	-245.1432	Hannan-Quinn criter.		17.07389
F-statistic	0.038659	Durbin-Watson stat		1.789904
Prob(F-statistic)	0.845597			

### c. Uji Unit Root Variabel PDB Tingkat Level

Null Hypothesis: PDB has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.026153	0.9957
Test critical values:		
1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(PDB)  
 Method: Least Squares  
 Date: 05/19/16 Time: 20:54  
 Sample (adjusted): 1986 2014  
 Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PDB(-1)	0.028302	0.027581	1.026153	0.3139
C	171588.0	591392.8	0.290142	0.7739
R-squared	0.037536	Mean dependent var		757375.6
Adjusted R-squared	0.001889	S.D. dependent var		832732.1
S.E. of regression	831945.2	Akaike info criterion		30.16739
Sum squared resid	1.87E+13	Schwarz criterion		30.26169
Log likelihood	-435.4272	Hannan-Quinn criter.		30.19693
F-statistic	1.052990	Durbin-Watson stat		1.425429
Prob(F-statistic)	0.313926			

#### d. Uji Unit Root Variabel PENDUDUK Tingkat Level

Null Hypothesis: PENDUDUK has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.040527	0.9959
Test critical values:		
1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(PENDUDUK)  
 Method: Least Squares  
 Date: 05/19/16 Time: 20:56  
 Sample (adjusted): 1986 2014  
 Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PENDUDUK(-1)	0.009842	0.009459	1.040527	0.3073
C	982129.1	1952709.	0.502957	0.6191
R-squared	0.038554	Mean dependent var		3000372.
Adjusted R-squared	0.002945	S.D. dependent var		1216520.
S.E. of regression	1214728.	Akaike info criterion		30.92441
Sum squared resid	3.98E+13	Schwarz criterion		31.01871
Log likelihood	-446.4039	Hannan-Quinn criter.		30.95394
F-statistic	1.082696	Durbin-Watson stat		1.801547
Prob(F-statistic)	0.307324			

### e. Uji Unit Root Variabel PG Tingkat Level

Null Hypothesis: PG has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	1.014497	0.9956
Test critical values:		
1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(PG)  
 Method: Least Squares  
 Date: 05/19/16 Time: 20:58  
 Sample (adjusted): 1986 2014  
 Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PG(-1)	0.051397	0.050662	1.014497	0.3194
C	-48306.45	172439.9	-0.280135	0.7815
R-squared	0.036719	Mean dependent var		120034.5
Adjusted R-squared	0.001042	S.D. dependent var		252774.3
S.E. of regression	252642.6	Akaike info criterion		27.78381
Sum squared resid	1.72E+12	Schwarz criterion		27.87811
Log likelihood	-400.8653	Hannan-Quinn criter.		27.81334
F-statistic	1.029205	Durbin-Watson stat		2.218315
Prob(F-statistic)	0.319351			

## 2. Uji Derajat Integrasi

### a. Uji Unit Root variable HGD Tingkat First Difference

Null Hypothesis: D(HGD) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.204492	0.0000
Test critical values: 1% level	-3.689194	
5% level	-2.971853	
10% level	-2.625121	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(HGD,2)

Method: Least Squares

Date: 05/19/16 Time: 20:39

Sample (adjusted): 1987 2014

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HGD(-1))	-1.331773	0.184853	-7.204492	0.0000
C	517.7631	183.6192	2.819766	0.0091
R-squared	0.666259	Mean dependent var		2.215714
Adjusted R-squared	0.653423	S.D. dependent var		1519.939
S.E. of regression	894.8005	Akaike info criterion		16.49983
Sum squared resid	20817368	Schwarz criterion		16.59499
Log likelihood	-228.9976	Hannan-Quinn criter.		16.52892
F-statistic	51.90471	Durbin-Watson stat		1.939221
Prob(F-statistic)	0.000000			

## b. Uji Unit Root variabel KURS Tingkat First Difference

Null Hypothesis: D(KURS) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.611274	0.0010
Test critical values:		
1% level	-3.689194	
5% level	-2.971853	
10% level	-2.625121	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(KURS,2)

Method: Least Squares

Date: 05/19/16 Time: 20:54

Sample (adjusted): 1987 2014

Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(KURS(-1))	-0.918964	0.199286	-4.611274	0.0001
C	402.0512	239.2607	1.680389	0.1049
R-squared	0.449897	Mean dependent var		38.93750
Adjusted R-squared	0.428739	S.D. dependent var		1581.751
S.E. of regression	1195.516	Akaike info criterion		17.07929
Sum squared resid	37160729	Schwarz criterion		17.17445
Log likelihood	-237.1101	Hannan-Quinn criter.		17.10838
F-statistic	21.26384	Durbin-Watson stat		1.942676
Prob(F-statistic)	0.000094			

### c. Uji Unit Root variabel PDB Tingkat First Difference

Null Hypothesis: D(PDB) has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.612217	0.0120
Test critical values:		
1% level	-3.689194	
5% level	-2.971853	
10% level	-2.625121	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(PDB,2)  
 Method: Least Squares  
 Date: 05/19/16 Time: 20:55  
 Sample (adjusted): 1987 2014  
 Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PDB(-1))	-0.671115	0.185790	-3.612217	0.0013
C	524563.6	206531.7	2.539870	0.0174
R-squared	0.334155	Mean dependent var		26991.90
Adjusted R-squared	0.308545	S.D. dependent var		979260.7
S.E. of regression	814292.0	Akaike info criterion		30.12677
Sum squared resid	1.72E+13	Schwarz criterion		30.22193
Log likelihood	-419.7748	Hannan-Quinn criter.		30.15587
F-statistic	13.04812	Durbin-Watson stat		1.953415
Prob(F-statistic)	0.001274			



### d. Uji Unit Root variabel PENDUDUK Tingkat First Difference

Null Hypothesis: D(PENDUDUK) has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.424211	0.0017
Test critical values: 1% level	-3.689194	
5% level	-2.971853	
10% level	-2.625121	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(PENDUDUK,2)  
 Method: Least Squares  
 Date: 05/19/16 Time: 20:57  
 Sample (adjusted): 1987 2014  
 Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PENDUDUK(-1))	-0.859556	0.194285	-4.424211	0.0002
C	2590489.	626658.9	4.133810	0.0003
R-squared	0.429495	Mean dependent var		22132.14
Adjusted R-squared	0.407552	S.D. dependent var		1622407.
S.E. of regression	1248776.	Akaike info criterion		30.98198
Sum squared resid	4.05E+13	Schwarz criterion		31.07713
Log likelihood	-431.7477	Hannan-Quinn criter.		31.01107
F-statistic	19.57365	Durbin-Watson stat		2.007662
Prob(F-statistic)	0.000154			

### e. Uji Unit Root variabel PG (Permintaan Gula) Tingkat First Difference

Null Hypothesis: D(PG) has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.206918	0.0002
Test critical values: 1% level	-3.689194	
5% level	-2.971853	
10% level	-2.625121	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(PG,2)  
 Method: Least Squares  
 Date: 05/19/16 Time: 20:59  
 Sample (adjusted): 1987 2014  
 Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PG(-1))	-1.019083	0.195717	-5.206918	0.0000
C	125925.9	54525.63	2.309480	0.0291
R-squared	0.510468	Mean dependent var		5911.786
Adjusted R-squared	0.491640	S.D. dependent var		366731.0
S.E. of regression	261476.8	Akaike info criterion		27.85483
Sum squared resid	1.78E+12	Schwarz criterion		27.94999
Log likelihood	-387.9676	Hannan-Quinn criter.		27.88392
F-statistic	27.11200	Durbin-Watson stat		1.985594
Prob(F-statistic)	0.000019			

### 3. Uji Jangka Panjang (Uji Kointegrasi)

Dependent Variable: LOG(PG)

Method: Least Squares

Date: 04/01/16 Time: 07:10

Sample: 1985 2014

Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-29.47861	12.32930	-2.390938	0.0247
LOG(PENDUDUK)	2.299977	0.853444	2.694935	0.0124
LOG(PDBDOMESTIK)	0.044637	0.260436	0.171395	0.8653
LOG(KURS)	-0.188032	0.046917	-4.007788	0.0005
LOG(HGD)	0.156907	0.073032	2.148455	0.0416
R-squared	0.964115	Mean dependent var	14.98496	
Adjusted R-squared	0.958373	S.D. dependent var	0.287165	
S.E. of regression	0.058589	Akaike info criterion	-2.685517	
Sum squared resid	0.085818	Schwarz criterion	-2.451984	
Log likelihood	45.28276	Hannan-Quinn criter.	-2.610808	
F-statistic	167.9159	Durbin-Watson stat	1.384049	
Prob(F-statistic)	0.000000			

#### 4. Uji Residual E pada Tingkat Level

Null Hypothesis: ECT has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.973298	0.0049
Test critical values:		
1% level	-3.679322	
5% level	-2.967767	
10% level	-2.622989	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECT)

Method: Least Squares

Date: 05/21/16 Time: 20:12

Sample (adjusted): 1986 2014

Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECT(-1)	-0.747831	0.188214	-3.973298	0.0005
C	-0.001863	0.009799	-0.190085	0.8507
R-squared	0.368969	Mean dependent var		0.000327
Adjusted R-squared	0.345597	S.D. dependent var		0.065130
S.E. of regression	0.052687	Akaike info criterion		-2.982431
Sum squared resid	0.074949	Schwarz criterion		-2.888134
Log likelihood	45.24524	Hannan-Quinn criter.		-2.952898
F-statistic	15.78710	Durbin-Watson stat		2.081781
Prob(F-statistic)	0.000475			

## 5. Uji ECM

Dependent Variable: D(LOG(PG))

Method: Least Squares

Date: 04/01/16 Time: 07:05

Sample (adjusted): 1986 2014

Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002424	0.029949	0.080926	0.9362
D(LOG(PENDUDUK))	0.680165	1.735370	0.391942	0.6987
D(LOG(PDBDOMESTIK))	0.621992	0.251894	2.469260	0.0214
D(LOG(KURS))	-0.106847	0.056013	-1.907528	0.0690
D(LOG(HGD))	0.056803	0.047096	1.206104	0.2400
ECT(-1)	-0.668493	0.185731	-3.599246	0.0015
R-squared	0.667264	Mean dependent var		0.032531
Adjusted R-squared	0.594931	S.D. dependent var		0.073795
S.E. of regression	0.046967	Akaike info criterion		-3.096761
Sum squared resid	0.050735	Schwarz criterion		-2.813873
Log likelihood	50.90304	Hannan-Quinn criter.		-3.008164
F-statistic	9.224791	Durbin-Watson stat		2.127717
Prob(F-statistic)	0.000063			

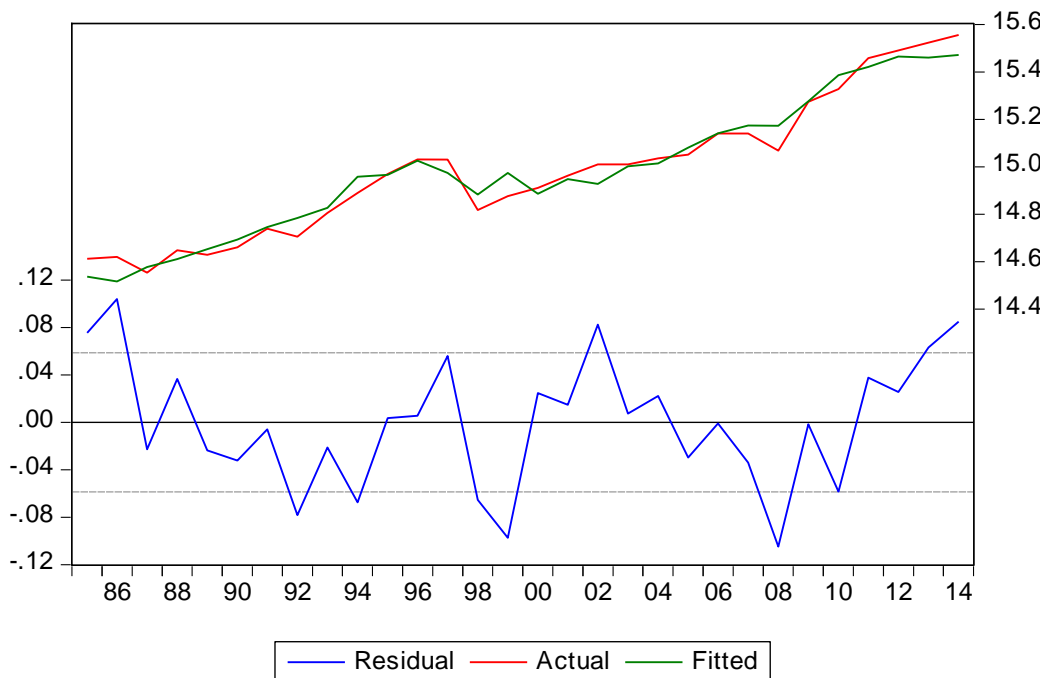
## 11. Uji Asumsi Klasik

### a. Uji Autokorelasi

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.322056	Prob. F(2,23)	0.2861
Obs*R-squared	3.093238	Prob. Chi-Square(2)	0.2130

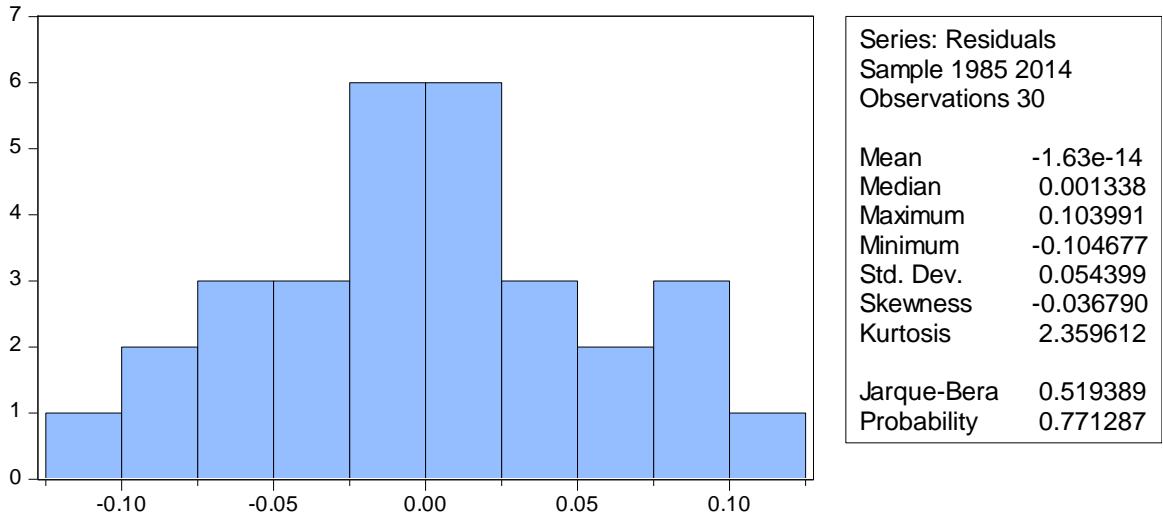
### b. Uji Heteroskedastisitas



Heteroskedasticity Test: White

F-statistic	0.860248	Prob. F(11,18)	0.5900
Obs*R-squared	10.33699	Prob. Chi-Square(11)	0.5004
Scaled explained SS	4.879961	Prob. Chi-Square(11)	0.9368

**d. Uji Normalitas**



**e. Uji Linearitas**

Ramsey RESET Test  
 Equation: UNTITLED  
 Specification: LOG(PG) C LOG(PENDUDUK) LOG(PDBDOMESTIK)  
 LOG(KURS) LOG(HGD)  
 Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	4.285188	24	0.0003
F-statistic	18.36283	(1, 24)	0.0003
Likelihood ratio	17.04653	1	0.0000

F-test summary:

**f. Uji Multikolinearitas**

	PENDUDUK	PDBDOMESTIK	KURS	HGD
PENDUDUK	1.000000	0.499324	-0.054213	0.397610
PDBDOMESTIK	0.499324	1.000000	-0.314452	0.170034
KURS	-0.054213	-0.314452	1.000000	0.168941
HGD	0.397610	0.170034	0.168941	1.000000

## LAMPIRAN 2

### Data Jumlah Penduduk

<b>Tahun</b>	<b>Jumlah Penduduk</b>	<b>Tahun</b>	<b>Jumlah Penduduk</b>
1985	165,154,000	2000	205,132,000
1986	167,881,000	2001	207,995,000
1987	170,653,000	2002	210,898,000
1988	173,472,000	2003	213,841,000
1989	176,336,000	2004	216,826,000
1990	179,379,000	2005	219,852,000
1991	182,940,000	2006	222,747,000
1992	186,043,000	2007	225,642,000
1993	189.136.000	2008	228,523,000
1994	192,217,000	2009	231,370,000
1995	195,283,000	2010	237,556,000
1996	198,320,000	2011	241,990,700
1997	201,353,000	2012	245,425,200
1998	204,393,000	2013	248,818,100
1999	207,437,000	2014	252,164,800

Sumber : BPS (diolah)



### Data Permintaan Gula

<b>Tahun</b>	<b>Permintaan Gula</b>	<b>Tahun</b>	<b>Permintaan Gula</b>
1985	2,219,000	2000	2,989,171
1986	2,237,000	2001	3,150,866
1987	2,093,242	2002	3,300,808
1988	2,298,898	2003	3,300,811
1989	2,256,009	2004	3,388,808
1990	2,328,000	2005	3,439,640
1991	2,519,732	2006	3,760,000
1992	2,435,166	2007	3,759,524
1993	2,691,856	2008	3,500,000
1994	2,929,123	2009	4,300,000
1995	3,170,936	2010	4,534,500
1996	3,374,010	2011	5,170,099
1997	3,366,944	2012	5,339,853
1998	2,724,953	2013	5,516,470
1999	2,889,171	2014	5,700,000

Sumber : Pusat data dan Informasi Pertanian (2010), Direktorat Jendral Pengolahan dan Pemasaran Pertanian (2014)

### Data Harga Gula di Indonesia

<b>Tahun</b>	<b>Harga</b>	<b>Tahun</b>	<b>Harga</b>
1985	1,034.82	2000	4,496.33
1986	1,110.78	2001	5,982.93
1987	1,280.32	2002	3,529.00
1988	1,310.43	2003	4,307.00
1989	1,375.86	2004	4,187.00
1990	1,450.32	2005	5,531.00
1991	1,578.96	2006	5,980.00
1992	1,616.91	2007	6,341.00
1993	1,693.35	2008	6,191.00
1994	3,178.92	2009	8,205.00
1995	2,762.02	2010	10,509.00
1996	3,301.82	2011	9,981.00
1997	4,182.82	2012	11,494.00
1998	3,792.62	2013	11,874.00
1999	4,701.73	2014	12,012.00

Sumber : Badan Urusan Logistik (BULOG)

### Data Impor Gula Indonesia

<b>Tahun</b>	<b>Impor</b>	<b>Tahun</b>	<b>Impor</b>
1985	4,407	2000	1,677,611
1986	79,932	2001	1,469,244
1987	129,383	2002	1,113,777
1988	130,331	2003	1,079,592
1989	325,930	2004	1,181,397
1990	280,978	2005	2,033,348
1991	73,986	2006	1,452,956
1992	294,226	2007	3,027,423
1993	181,334	2008	1,044,000
1994	21,207	2009	1,660,200
1995	578,519	2010	2,320,500
1996	1,286,080	2011	2,717,019
1997	1,364,563	2012	2,876,858
1998	950,141	2013	434,100
1999	1,583,957	2014	2,965,000

Sumber : Pusat data dan Informasi Pertanian (2010), Direktorat Jendral Pengolahan dan Pemasaran Pertanian (2014)

### Data Kurs terhadap Dollar Amerika

<b>Tahun</b>	<b>Kurs</b>	<b>Tahun</b>	<b>Kurs</b>
1985	1,125.25	2000	9,595.00
1986	1,641.00	2001	10,400.00
1987	1,650.00	2002	8,940.00
1988	1,729.00	2003	8,465.00
1989	1,795.48	2004	9,290.00
1990	1,901.00	2005	9,830.00
1991	1,992.00	2006	9,020.00
1992	2,062.00	2007	9,419.00
1993	2,110.00	2008	10,950.00
1994	2,200.00	2009	9,400.00
1995	2,308.00	2010	8,991.00
1996	2,383.00	2011	9,068.00
1997	4,650.00	2012	9,670.00
1998	8,025.00	2013	12,189.00
1999	7,100.00	2014	13,795.00

Sumber : Bank Indonesia (diolah)

### Hasil Uji Akar Unit Root

Variabel	Level	1 <sup>st</sup> Difference	2 <sup>nd</sup> Difference
Permintaan Gula	0.9956	0.0002	0.0000
Harga Gula Domestik	0.9978	0.0000	0.0000
Jumlah Penduduk	0.9959	0.0017	0.0000
PDB	0.9957	0.0120	0.0000
Kurs	0.9283	0.0010	0.0000

Test	Adf					
Variabel	Level	Prob	Note	First Differnce	Prob	Note
	T-Statistik			T-Statistik		
PG	1.014497	0.9956	Tidak Stationer	-5.206918	0.0002	Stationer
HGD	1.276843	0.9978	Tidak Stationer	-7.204492	0.0000	Stationer
PENDUDUK	1.040527	0.9959	Tidak Stationer	-4.424211	0.0017	Stationer
PDB	1.026153	0.9957	Tidak Stationer	-3.612217	0.0120	Stationer
KURS	-0.196620	0.9283	Tidak Stationer	-4.611274	0.0010	Stationer