

APPENDIX

APPENDIX 1

Year	Rubber price	Production (tons)	Export (tons)	Exchange rate
2011M01	168.66	249288.19	248711.97	30.48
2011M02	190.31	254461.81	247501.11	30.7
2011M03	167.59	259531.25	246507.02	30.36
2011M04	176.63	264496.53	245729.71	30.05
2011M05	156.76	269357.64	245169.19	30.22
2011M06	153.44	274114.58	244825.44	30.47
2011M07	144.43	278767.36	244698.47	30.1
2011M08	141.03	283315.97	244788.28	29.87
2011M09	139.74	287760.42	245094.87	30.37
2011M10	127.17	292100.69	245618.24	30.86
2011M11	107.33	296336.81	246358.39	30.93
2011M12	106.32	300468.75	247315.32	31.14
2012M01	115.09	304496.53	248489.03	31.52
2012M02	125.38	308420.14	249879.51	30.72
2012M03	122.64	312239.58	251486.78	30.68
2012M04	119.8	315954.86	253310.83	30.86
2012M05	117.29	319565.97	255351.65	31.28
2012M06	107.35	323072.92	257609.26	31.63
2012M07	99.54	326475.69	260083.65	31.63
2012M08	88.38	329774.31	262774.81	31.43
2012M09	93.64	332968.75	265682.75	30.98
2012M10	98.72	336059.03	268807.48	30.68
2012M11	91.99	339045.14	272148.98	30.7
2012M12	95.44	341927.08	275707.27	30.63
2013M01	99.83	347049.58	290688.63	30.1
2013M02	95.98	349624.81	294210.28	29.82
2013M03	87.61	351997.49	297478.51	29.53
2013M04	82.79	354167.63	300493.33	29.07
2013M05	90	356135.22	303254.73	29.75
2013M06	86.98	357900.27	305762.72	30.79
2013M07	80.64	359462.77	308017.29	31.12
2013M08	81.19	360822.72	310018.45	31.53
2013M09	84.17	361980.13	311766.19	31.69
2013M10	79.48	362934.99	313260.52	31.19
2013M11	78.82	363687.31	314501.43	31.6
2013M12	83.1	364237.08	315488.93	32.36
2014M01	77.36	361825.81	312615.68	32.92

2014M02	70.43	362086.23	313247.71	32.65
2014M03	73.89	362259.84	313777.68	32.38
2014M04	71.02	362346.64	314205.58	32.3
2014M05	67.58	362346.64	314531.43	32.52
2014M06	67.9	362259.84	314755.22	32.51
2014M07	64.76	362086.23	314876.96	32.13
2014M08	59.85	361825.81	314896.63	32.02
2014M09	53.58	361478.59	314814.25	32.18
2014M10	52.79	361044.56	314629.80	32.45
2014M11	54	360523.73	314343.30	32.78
2014M12	53.6	359916.09	313954.74	32.9
2015M01	55.76	354054.91	315444.18	32.74
2015M02	59.96	353490.45	314768.43	32.58
2015M03	58.59	353055.97	313907.53	32.62
2015M04	56.05	352751.46	312861.50	32.49
2015M05	62.12	352576.94	311630.33	33.5
2015M06	62.38	352532.40	310214.03	33.73
2015M07	57.08	352617.83	308612.58	34.27
2015M08	52.61	352833.25	306826.00	35.38
2015M09	48.73	353178.65	304854.28	35.99
2015M10	47.38	353654.03	302697.42	35.71
2015M11	44.19	354259.39	300355.43	35.78
2015M12	45.49	354994.73	297828.29	35.99
2016M01	44.66	355860.05	295116.02	36.13
2016M02	59.96	356855.35	292218.61	35.62
2016M03	51.36	357980.63	289136.07	35.2
2016M04	60.31	359235.89	285868.38	35.09
2016M05	59.87	360621.13	282415.56	35.41
2016M06	55.41	362136.35	278777.60	35.29
2016M07	61.87	363781.55	274954.50	35.02
2016M08	58.66	365556.73	270946.27	34.74
2016M09	56.26	367461.89	266752.90	34.73
2016M10	59.11	369497.03	262374.39	35.03
2016M11	66.23	371662.16	257810.74	35.34
2016M12	79.59	373957.26	253061.95	35.79

Source: Rubber Authority of Thailand data files, Rubber Research Institute Department of Agricultural, and Bank of Thailand, from 1st January 2011 to 31nd December 2016.

APPENDIX 2

DESCRIPTIVE STATISTIC

	RUBBER_P RICE	EXPORT_ TONS_	EXCHANG E_RATE	PRODUCTI ON__TONS
Mean	86.32847	284981.6	32.37153	339369.5
Median	79.15000	293214.4	32.07500	353854.5
Maximum	190.3100	315488.9	36.13000	373957.3
Minimum	44.19000	244698.5	29.07000	249288.2
Std. Dev.	35.58294	27218.87	1.993474	32740.44
Skewness	1.099790	-0.287118	0.505202	-1.347420
Kurtosis	3.452408	1.429957	2.012000	3.577686
Jarque-Bera Probability	15.12848 0.000519	8.384341 0.015113	5.991181 0.050007	22.78766 0.000011
Sum	6215.650	20518673	2330.750	24434606
Sum Sq. Dev.	89896.33	5.26E+10	282.1497	7.61E+10
Observations	72	72	72	72

APPENDIX 3

ORDINARY LEAST SQUARE (OLS) TEST

Dependent Variable: RUBBER_PRICE

Method: Least Squares

Date: 04/02/18 Time: 00:22

Sample: 2011M01 2016M12

Included observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	566.7017	21.66654	26.15561	0.0000
EXPORT__TONS_	-0.000264	7.13E-05	-3.710298	0.0004
EXCHANGE_RATE	-5.868380	0.755170	-7.770943	0.0000
PRODUCTION__TO NS_	-0.000634	6.84E-05	-9.263717	0.0000
R-squared	0.922020	Mean dependent var	86.32847	
Adjusted R-squared	0.918580	S.D. dependent var	35.58294	
S.E. of regression	10.15332	Akaike info criterion	7.527432	
Sum squared resid	7010.120	Schwarz criterion	7.653914	
Log likelihood	-266.9876	Hannan-Quinn criter.	7.577785	
F-statistic	268.0060	Durbin-Watson stat	0.600352	
Prob(F-statistic)	0.000000			

APPENDIX 4

CLASSICAL ASSUMPTION TEST

APPENDIX 4.1 Autocorrelation Test

Dependent Variable: RUBBER_PRICE

Method: ARMA Maximum Likelihood (OPG - BHHH)

Date: 04/02/18 Time: 00:26

Sample: 2011M01 2016M12

Included observations: 72

Convergence achieved after 18 iterations

Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	512.6181	63.21730	8.108826	0.0000
EXPORT__TONS_	-0.000321	0.000173	-1.859639	0.0674
EXCHANGE_RATE	-3.481807	2.204759	-1.579224	0.1191
PRODUCTION__TO				
NS_	-0.000651	0.000171	-3.806123	0.0003
AR(1)	0.761470	0.079509	9.577185	0.0000
SIGMASQ	49.76766	6.970645	7.139607	0.0000
R-squared	0.960140	Mean dependent var		86.32847
Adjusted R-squared	0.957120	S.D. dependent var		35.58294
S.E. of regression	7.368310	Akaike info criterion		6.923952
Sum squared resid	3583.272	Schwarz criterion		7.113675
Log likelihood	-243.2623	Hannan-Quinn criter.		6.999481
F-statistic	317.9587	Durbin-Watson stat		2.037412
Prob(F-statistic)	0.000000			
Inverted AR Roots	.76			

APPENDIX 4.2 Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.163280	Prob. F(3,68)	0.3302
Obs*R-squared	3.514743	Prob. Chi-Square(3)	0.3189
Scaled explained SS	4.649145	Prob. Chi-Square(3)	0.1994

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 04/02/18 Time: 00:24

Sample: 2011M01 2016M12

Included observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	403.6479	359.0846	1.124103	0.2649
EXPORT__TONS_	-0.000278	0.001181	-0.235335	0.8147
EXCHANGE_RATE	4.179508	12.51560	0.333944	0.7394
PRODUCTION__TO NS_	-0.001068	0.001134	-0.941854	0.3496
R-squared	0.048816	Mean dependent var	97.36278	
Adjusted R-squared	0.006852	S.D. dependent var	168.8529	
S.E. of regression	168.2734	Akaike info criterion	13.14301	
Sum squared resid	1925483.	Schwarz criterion	13.26949	
Log likelihood	-469.1483	Hannan-Quinn criter.	13.19336	
F-statistic	1.163280	Durbin-Watson stat	1.558725	
Prob(F-statistic)	0.330220			

APPENDIX 4.3 Multicollinearity Test

Variance Inflation Factors

Date: 04/02/18 Time: 00:25

Sample: 2011M01 2016M12

Included observations: 72

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	469.4390	327.8650	NA
EXPORT__TONS_ EXCHANGE_RAT	5.08E-09	290.6064	2.590886
E	0.570281	418.9406	1.560818
PRODUCTION__T ONS_	4.68E-09	379.8642	3.454696

APPENDIX 4.4 Normality Test



