BAB V

KESIMPULAN DAN SARAN

5.1. Kesimpulan

Berdasarkan penelitian yang telah dilakukan, maka dapat ditarik kesimpulan sebagai berikut:

1. Dari model yang dibangun dalam penelitian ini, hipotesis Environmental Kuznets Curve (EKC) tidak terbukti di Indonesia dalam jangka panjang maupun jangka pendek. Dalam jangka panjang pertumbuhan ekonomi mempunyai pengaruh dalam penurunan tingkat emisi CO_2, sedangkan variabel keterbukaan perdagangan dalam jangka panjang memiliki efek pada kenaikan tingkat emisi CO_2.
2. Dalam jangka pendek variabel pertumbuhan ekonomi (Ln GDP(-2)) dan keterbukaan perdagangan berpengaruh secara positif pada kenaikan tingkat emisi CO_2 di Indonesia.

5.2. Saran

Merujuk kesimpulan diatas, semua variabel berpengaruh terhadap kerusakan lingkungan, maka dari itu diperlukan aksi tindak lanjut sebagai berikut:

1. Pemerintah sebaiknya memperhatikan aspek lingkungan dalam penentuan kebijakan peningkatan pertumbuhan ekonomi. Memperketat kebijakan instrument pengendalian lingkungan sepeti AMDAL terhadap semua perusahaan maupun perorangan.

2. Menggencarkan alternatif penggunaan sumberdaya energi yang ramah lingkungan. Pemerintah diharapkan untuk mempertahankan program ramah lingkungan seperti *green investment* yang sudah dijalankannya.
3. Menggalakkan edukasi perlunya menjaga kelestarian dan kualitas lingkungan.

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LAMPIRAN

Lampiran 1

Data Penelitian berupa data GDP, GDP^2, Keterbukaan Perdagangan

TAHUN	LnCO2	LnGDP	LnGDP2	LnTO
1967	3,1441	4,0137	16,10979	3,2442
1968	3,3331	4,1752	17,4323	3,2751
1969	3,5071	4,3121	18,59421	3,1714
1970	3,4989	4,3784	19,17039	3,3562
1971	3,5087	4,3717	19,11176	3,4359
1972	3,6083	4,5094	20,33469	3,5673
1973	3,6978	4,8753	23,76855	3,6771
1974	3,7045	5,3107	28,20353	3,7193
1975	3,7207	5,4515	29,71885	3,7959
1976	4,0216	5,6283	31,67776	3,7613
1977	4,0951	5,8102	33,75842	3,8043
1978	4,2016	5,9024	34,83833	3,8545
1979	4,3201	5,8775	34,54501	3,9082
1980	4,1033	6,1976	38,41025	3,9637
1981	4,1958	6,3396	40,19053	3,9736
1982	4,6019	6,3693	40,56798	4,0151
1983	4,1963	6,2401	38,93885	4,0352
1984	4,2406	6,264	39,2377	4,0428
1985	4,2971	6,2479	39,03625	3,8003

1986	4,2808	6,163	37,98257	3,7138
1987	4,2746	6,0917	37,10881	3,8495
1988	4,3245	6,1774	38,16027	3,8555
1989	4,2971	6,2728	39,34802	3,8934
1990	4,4015	6,3717	40,59856	3,9682
1991	4,5036	6,4485	41,58315	4,0044
1992	4,5112	6,5249	42,57432	4,0505
1993	4,5766	6,7188	45,14227	3,9224
1994	4,6205	6,8158	46,45513	3,9488
1995	4,7287	7,0038	49,05321	4,0082
1996	4,7647	7,0365	49,51233	4,0163
1997	4,3991	7,0195	49,27338	4,0252
1998	4,8436	6,1397	37,69592	4,5662
1999	4,8958	6,5089	42,36578	4,1422
2000	4,8862	6,6595	44,34894	4,2688
2001	4,9471	6,7577	45,66651	4,2455
2002	5,9474	6,9025	47,64451	4,0788
2003	5,0253	6,9713	48,59902	3,2818
2004	5,9249	7,0477	49,67008	4,0903
2005	5,0251	7,1414	50,99959	4,1586
2006	5,0674	7,3713	54,33606	4,0371
2007	5,0969	7,5283	56,6753	4,0042
2008	5,1863	7,681	58,99776	4,0172

2009	5,1078	7,7236	59,654	3,8179
2010	5,1498	8,0463	64,74294	3,8437
2011	5,2781	8,2005	67,2482	3,9156
2012	5,2776	8,2145	67,47801	3,9036
2013	5,1953	8,1953	67,16294	3,8843
2014	5,2579	8,1581	66,5546	3,8728
2015	5,2468	8,1112	65,79157	3,7361
2016	5,243	8,1783	66,88459	3,6222
2017	5,3051	8,2525	68,10376	3,6726
2018	5,3837	8,2671	68,34494	3,7629
2019	5,4377	8,3272	69,34226	3,6229

Lampiran 2

Hasil Output Eviews 12

Uji Stasioneritas

1. LnCO2

Null Hypothesis: LNCO2 has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.687713	0.4313
Test critical values:	1% level	-3.565430	
	5% level	-2.919952	
	10% level	-2.597905	

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

2. LnGDP

Null Hypothesis: LNGDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.702825	0.4239
Test critical values:	1% level	-3.562669	
	5% level	-2.918778	
	10% level	-2.597285	

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

3. LnGDP2

Null Hypothesis: LNGDP2 has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.904379	0.7792
Test critical values:	1% level	-3.562669	
	5% level	-2.918778	
	10% level	-2.597285	

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

4. LnTO

Null Hypothesis: LNTO has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.451520	0.0135
Test critical values:	1% level	-3.562669	
	5% level	-2.918778	
	10% level	-2.597285	

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

Uji Derajat Integrasi

1. LnCO2

Null Hypothesis: D(LNCO2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-15.26263	0.0000
Test critical values:	1% level	-3.565430	
	5% level	-2.919952	
	10% level	-2.597905	

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

2. LnGDP

Null Hypothesis: D(LNGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.566362	0.0000
Test critical values:	1% level	-3.565430	
	5% level	-2.919952	
	10% level	-2.597905	

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

3. LnGDP2

Null Hypothesis: D(LNGDP2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.746477	0.0000
Test critical values:	1% level	-3.565430	
	5% level	-2.919952	
	10% level	-2.597905	

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

4. LnTO

Null Hypothesis: D(LNTO) has a unit root
Exogenous: Constant
Lag Length: 4 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.947386	0.0002
Test critical values:	1% level	-3.577723	
	5% level	-2.925169	
	10% level	-2.600658	

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

Uji Kointegrasi Bound Testing Approach

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.079882	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Hasil Estimasi ARDL

Dependent Variable: LNCO2
Method: ARDL
Date: 04/03/23 Time: 23:12
Sample (adjusted): 1971 2019
Included observations: 49 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LNGDP LNGDP2 LNTO
Fixed regressors: C
Number of models evaluated: 500
Selected Model: ARDL(3, 3, 1, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNCO2(-1)	0.231500	0.175163	1.321622	0.1951
LNCO2(-2)	-0.080326	0.189526	-0.423825	0.6744
LNCO2(-3)	0.490342	0.162887	3.010318	0.0049
LNGDP	0.919059	1.513083	0.607408	0.5476
LNGDP(-1)	-2.773505	1.437155	-1.929858	0.0620
LNGDP(-2)	0.565108	0.255094	2.215294	0.0335
LNGDP(-3)	-0.400881	0.169368	-2.366919	0.0238
LNGDP2	-0.049791	0.116024	-0.429143	0.6705
LNGDP2(-1)	0.180244	0.110630	1.629261	0.1125
LNTO	0.553575	0.228034	2.427603	0.0206
LNTO(-1)	-0.802924	0.280505	-2.862418	0.0071
LNTO(-2)	1.005410	0.273442	3.676870	0.0008
LNTO(-3)	-0.212300	0.232448	-0.913325	0.3675
LNTO(-4)	0.825332	0.201955	4.086706	0.0003
C	1.718567	1.094841	1.569695	0.1257

R-squared	0.932054	Mean dependent var	4.671941
Adjusted R-squared	0.904076	S.D. dependent var	0.585402
S.E. of regression	0.181308	Akaike info criterion	-0.330451
Sum squared resid	1.117671	Schwarz criterion	0.248678
Log likelihood	23.09605	Hannan-Quinn criter.	-0.110730
F-statistic	33.31407	Durbin-Watson stat	1.484201
Prob(F-statistic)	0.000000		

Koefisien Regresi Jangka Panjang

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP	-4.714899	2.290998	-2.058011	0.0473
LNGDP2	0.363903	0.162569	2.238449	0.0318
LNTO	3.819112	1.434191	2.662904	0.0118
C	4.793977	3.365095	1.424619	0.1634

EC = LNCO2 - (-4.7149*LNGDP + 0.3639*LNGDP2 + 3.8191*LNTO + 4.7940)

Koefisien Regresi Jangka Pendek

ARDL Error Correction Regression
Dependent Variable: D(LNCO2)
Selected Model: ARDL(3, 3, 1, 4)
Case 2: Restricted Constant and No Trend
Date: 04/03/23 Time: 23:13
Sample: 1967 2019
Included observations: 49

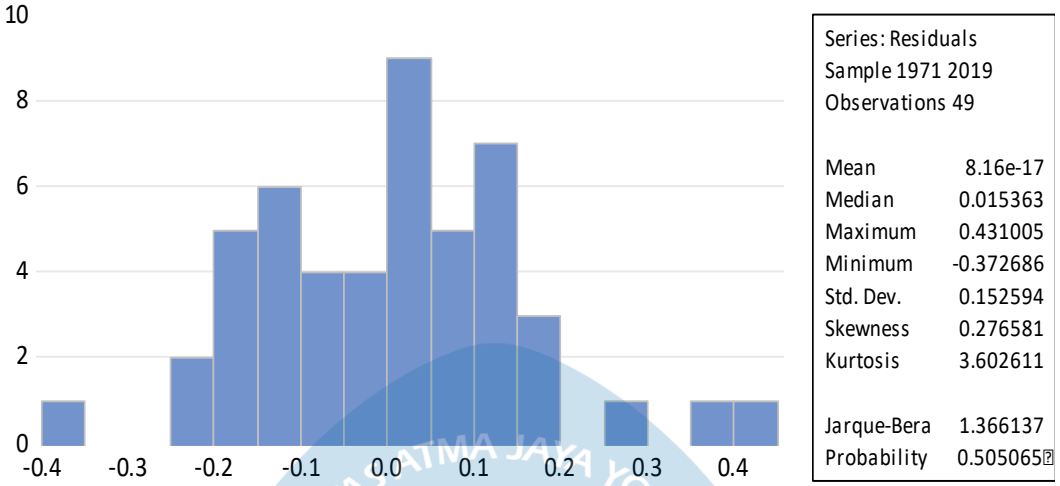
ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNCO2(-1))	-0.410016	0.148797	-2.755540	0.0093
D(LNCO2(-2))	-0.490342	0.143510	-3.416788	0.0017
D(LNGDP)	0.919059	1.146523	0.801606	0.4283
D(LNGDP(-1))	-0.164227	0.150358	-1.092239	0.2824
D(LNGDP(-2))	0.400881	0.146044	2.744930	0.0096
D(LNGDP2)	-0.049791	0.088818	-0.560596	0.5787
D(LNTO)	0.553575	0.193552	2.860080	0.0072
D(LNTO(-1))	-1.618441	0.266964	-6.062399	0.0000
D(LNTO(-2))	-0.613031	0.232003	-2.642339	0.0124
D(LNTO(-3))	-0.825332	0.188023	-4.389523	0.0001
CointEq(-1)*	-0.358485	0.067283	-5.327999	0.0000

R-squared	0.743865	Mean dependent var	0.039567
Adjusted R-squared	0.676461	S.D. dependent var	0.301510
S.E. of regression	0.171500	Akaike info criterion	-0.493716
Sum squared resid	1.117671	Schwarz criterion	-0.069022
Log likelihood	23.09605	Hannan-Quinn criter.	-0.332588
Durbin-Watson stat	1.484201		

* p-value incompatible with t-Bounds distribution.

Uji Normalitas



Uji Autokorelasi

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 3 lags

F-statistic	1.765818	Prob. F(3,31)	0.1742
Obs*R-squared	7.151336	Prob. Chi-Square(3)	0.0672

Uji Heteroskedasitas

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.654608	Prob. F(14,34)	0.7998
Obs*R-squared	10.40348	Prob. Chi-Square(14)	0.7321
Scaled explained SS	6.518139	Prob. Chi-Square(14)	0.9517