

BAB 5

PENUTUP

Bagian penutup akan membahas mengenai kesimpulan dan saran dari hasil penelitian. Kesimpulan dan saran dinyatakan secara terpisah.

5.1. Kesimpulan

Berdasarkan hasil dan pembahasan di depan diperoleh kesimpulan bahwa pertumbuhan ekonomi tidak menyebabkan indeks pembangunan manusia, dan indeks pembangunan manusia tidak menyebabkan pertumbuhan ekonomi. Pertumbuhan ekonomi masa lalu tidak menyebabkan pertumbuhan saat ini, dan indeks pembangunan manusia masa lalu tidak menyebabkan indeks pembangunan manusia saat ini.

5.2. Saran

Berdasarkan kesimpulan diatas, maka saran yang dapat diberikan penulis pada penelitian ini sebagai berikut:

1. Upaya pemerintah untuk menaikkan pertumbuhan ekonomi sebaiknya tidak terlalu mengandalkan upaya IPM. Upaya pemerintah untuk meningkatkan IPM sebaiknya tidak terlalu mengandalkan upaya pertumbuhan ekonomi
2. Karena pada penelitian ini tidak ditemukan hubungan kausalitas antara pertumbuhan ekonomi dan indeks pembangunan manusia mungkin hal terjadi karena keterbatasan jumlah observasi yang digunakan. Bagi

peneliti berikutnya mungkin akan lebih baik jika jumlah observasi ditambah.



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LAMPIRAN

LAMPIRAN 1 Data Pertumbuhan ekonomi dan IPM di Indonesia

Tahun 2011-2024

Tahun	IPM (Persen)	PDB (Persen)
2011	67.09	6.17
2012	67.7	6.03
2013	68.31	5.56
2014	68.9	5.01
2015	69.55	4.88
2016	70.18	5.03
2017	70.81	5.07
2018	71.39	5.17
2019	71.92	5.02
2020	72.81	-2.07
2021	73.16	3.7
2022	73.77	5.31
2023	74.39	5.05
2024	75.02	5.03

LAMPIRAN 2 UJI AKAR UNIT UNTUK Y (IPM)

Null Hypothesis: Y has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Fixed)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.945268	0.5655
Test critical values: 1% level	-5.124875	
5% level	-3.933364	
10% level	-3.420030	

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

Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 11

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(Y)
Method: Least Squares
Date: 09/28/25 Time: 16:58
Sample (adjusted): 2014 2024
Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Y(-1)	-0.579906	0.298111	-1.945268	0.0997
D(Y(-1))	0.572095	0.311127	1.838783	0.1156
D(Y(-2))	0.065286	0.405081	0.161168	0.8773
C	39.05551	19.78680	1.973816	0.0958
@TREND("2011")	0.294253	0.157579	1.867339	0.1111
R-squared	0.536046	Mean dependent var		0.535455
Adjusted R-squared	0.226743	S.D. dependent var		0.191644
S.E. of regression	0.168522	Akaike info criterion		-0.420547
Sum squared resid	0.170398	Schwarz criterion		-0.239686
Log likelihood	7.313009	Hannan-Quinn criter.		-0.534555
F-statistic	1.733077	Durbin-Watson stat		2.158606
Prob(F-statistic)	0.260469			

LAMPIRAN 3 UJI STATIONERITAS DATA UNTUK X (PDB)

Null Hypothesis: X has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Fixed)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.874427	0.6009
Test critical values: 1% level	-5.124875	
5% level	-3.933364	
10% level	-3.420030	

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

Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 11

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(X)
Method: Least Squares
Date: 09/28/25 Time: 17:01
Sample (adjusted): 2014 2024
Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X(-1)	-1.730676	0.923309	-1.874427	0.1100
D(X(-1))	0.659790	0.697868	0.945436	0.3809
D(X(-2))	0.349573	0.494307	0.707199	0.5060
C	10.13888	6.720516	1.508647	0.1821
@TREND("2011")	-0.323924	0.379418	-0.853740	0.4260
R-squared	0.542760	Mean dependent var	-0.048182	
Adjusted R-squared	0.237933	S.D. dependent var	2.942305	
S.E. of regression	2.568528	Akaike info criterion	5.027498	
Sum squared resid	39.58401	Schwarz criterion	5.208359	
Log likelihood	-22.65124	Hannan-Quinn criter.	4.913490	
F-statistic	1.780551	Durbin-Watson stat	2.143586	
Prob(F-statistic)	0.251249			

LAMPIRAN 4 UJI DERAJAT INTEGRASI UNTUK Y (IPM)

- First Difference

Null Hypothesis: D(Y) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Fixed)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.620340	0.0821
Test critical values: 1% level	-5.295384	
5% level	-4.008157	
10% level	-3.460791	

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

Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(Y,2)
Method: Least Squares
Date: 11/17/25 Time: 08:13
Sample (adjusted): 2015 2024
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Y(-1))	-3.961779	1.094311	-3.620340	0.0152
D(Y(-1),2)	1.700513	0.798730	2.129021	0.0865
D(Y(-2),2)	0.596051	0.376115	1.584757	0.1739
C	2.564826	0.716269	3.580816	0.0159
@TREND("2011")	-0.018090	0.011894	-1.520984	0.1887

R-squared	0.906393	Mean dependent var	0.004000
Adjusted R-squared	0.831507	S.D. dependent var	0.235193
S.E. of regression	0.096542	Akaike info criterion	-1.530834
Sum squared resid	0.046601	Schwarz criterion	-1.379541
Log likelihood	12.65417	Hannan-Quinn criter.	-1.696801
F-statistic	12.10369	Durbin-Watson stat	2.349054
Prob(F-statistic)	0.008756		

LAMPIRAN 5 UJI DERAJAT INTEGRASI UNTUK X (PDB)

- First Difference

Null Hypothesis: D(X) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Fixed)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.811088	0.0918
Test critical values: 1% level	-6.292057	
5% level	-4.450425	
10% level	-3.701534	

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

Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 7

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(X,2)
Method: Least Squares
Date: 11/08/25 Time: 15:11
Sample (adjusted): 2018 2024
Included observations: 7 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(X(-1))	-15.88838	4.168990	-3.811088	0.0625
D(X(-1),2)	11.68743	3.594566	3.251417	0.0830
D(X(-2),2)	6.058348	2.047313	2.959170	0.0977
C	-30.96644	19.61537	-1.578682	0.2552
@TREND("2011")	3.526608	2.123886	1.660451	0.2387

R-squared	0.991341	Mean dependent var	0.010000
Adjusted R-squared	0.974023	S.D. dependent var	37.98152
S.E. of regression	6.121606	Akaike info criterion	6.637335
Sum squared resid	74.94813	Schwarz criterion	6.598699
Log likelihood	-18.23067	Hannan-Quinn criter.	6.159806
F-statistic	57.24378	Durbin-Watson stat	2.047150
Prob(F-statistic)	0.017243		

LAMPIRAN 6 Uji *Lag Optimum* untuk Data X (PDB)

(Jumlah Lag $dX=1$ dan Jumlah Lag $dY=1$)

Dependent Variable: D(X)

Method: Least Squares

Date: 11/21/25 Time: 02:39

Sample (adjusted): 2016 2024

Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-53.28423	7.116732	-7.487177	0.0003
D(Y(-1))	87.81179	11.43792	7.677250	0.0003
D(X(-1))	-0.450333	0.090811	-4.959002	0.0026
R-squared	0.959734	Mean dependent var	0.178889	
Adjusted R-squared	0.946312	S.D. dependent var	17.57759	
S.E. of regression	4.072856	Akaike info criterion	5.907768	
Sum squared resid	99.52895	Schwarz criterion	5.973509	
Log likelihood	-23.58495	Hannan-Quinn criter.	5.765898	
F-statistic	71.50416	Durbin-Watson stat	0.722452	
Prob(F-statistic)	0.000065			

LAMPIRAN 7 Uji *Lag Optimum* untuk Data X (PDB)

(Jumlah Lag $dX=2$ dan Jumlah Lag $dY=1$)

Dependent Variable: D(X)
Method: Least Squares
Date: 11/21/25 Time: 02:40
Sample (adjusted): 2017 2024
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-44.63528	3.637382	-12.27127	0.0003
D(Y(-1))	73.17216	6.068618	12.05747	0.0003
D(X(-1))	-0.785679	0.083341	-9.427295	0.0007
D(X(-2))	-0.381318	0.082339	-4.631069	0.0098
R-squared	0.995024	Mean dependent var	0.281250	
Adjusted R-squared	0.991292	S.D. dependent var	18.78837	
S.E. of regression	1.753264	Akaike info criterion	4.267688	
Sum squared resid	12.29573	Schwarz criterion	4.307409	
Log likelihood	-13.07075	Hannan-Quinn criter.	3.999787	
F-statistic	266.6208	Durbin-Watson stat	1.798674	
Prob(F-statistic)	0.000046			

LAMPIRAN 8 Uji *Lag Optimum* untuk Data X (PDB)

(Jumlah Lag $dX=3$ dan Jumlah Lag $dY=1$)

Dependent Variable: D(X)

Method: Least Squares

Date: 11/21/25 Time: 02:40

Sample (adjusted): 2018 2024

Included observations: 7 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-45.76002	6.755223	-6.774020	0.0211
D(Y(-1))	75.50570	10.75995	7.017291	0.0197
D(X(-1))	-0.731181	0.288733	-2.532376	0.1269
D(X(-2))	-0.282509	0.574183	-0.492020	0.6714
D(X(-3))	0.090452	0.610622	0.148131	0.8958
R-squared	0.997184	Mean dependent var	0.357143	
Adjusted R-squared	0.991552	S.D. dependent var	20.29243	
S.E. of regression	1.865184	Akaike info criterion	4.260405	
Sum squared resid	6.957826	Schwarz criterion	4.221770	
Log likelihood	-9.911419	Hannan-Quinn criter.	3.782877	
F-statistic	177.0480	Durbin-Watson stat	2.967421	
Prob(F-statistic)	0.005624			

LAMPIRAN 9 Uji *Lag Optimum* untuk Data X (PDB)

(Jumlah Lag $dX=1$ dan Jumlah Lag $dY=2$)

Dependent Variable: D(X)

Method: Least Squares

Date: 11/21/25 Time: 02:41

Sample (adjusted): 2016 2024

Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-14.20434	14.57576	-0.974518	0.3746
D(Y(-1))	74.48035	9.059113	8.221594	0.0004
D(Y(-2))	-51.13089	17.99686	-2.841101	0.0362
D(X(-1))	-0.134026	0.127201	-1.053659	0.3403
R-squared	0.984598	Mean dependent var	0.178889	
Adjusted R-squared	0.975357	S.D. dependent var	17.57759	
S.E. of regression	2.759346	Akaike info criterion	5.168967	
Sum squared resid	38.06995	Schwarz criterion	5.256622	
Log likelihood	-19.26035	Hannan-Quinn criter.	4.979807	
F-statistic	106.5453	Durbin-Watson stat	1.656896	
Prob(F-statistic)	0.000060			

LAMPIRAN 10 Uji *Lag Optimum* untuk Data X (PDB)

(Jumlah Lag $dX=2$ dan Jumlah Lag $dY=2$)

Dependent Variable: D(X)

Method: Least Squares

Date: 11/21/25 Time: 02:42

Sample (adjusted): 2017 2024

Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-29.99621	20.51005	-1.462513	0.2398
D(Y(-1))	73.80035	6.519122	11.32060	0.0015
D(Y(-2))	-24.20576	33.30333	-0.726827	0.5199
D(X(-1))	-0.490947	0.415101	-1.182717	0.3221
D(X(-2))	-0.219273	0.239567	-0.915291	0.4275
R-squared	0.995769	Mean dependent var	0.281250	
Adjusted R-squared	0.990128	S.D. dependent var	18.78837	
S.E. of regression	1.866792	Akaike info criterion	4.355490	
Sum squared resid	10.45473	Schwarz criterion	4.405141	
Log likelihood	-12.42196	Hannan-Quinn criter.	4.020615	
F-statistic	176.5156	Durbin-Watson stat	2.673816	
Prob(F-statistic)	0.000686			

LAMPIRAN 11 Uji *Lag Optimum* untuk Data X (PDB)

(Jumlah Lag $dX=3$ dan Jumlah Lag $dY=2$)

Dependent Variable: D(X)
Method: Least Squares
Date: 11/21/25 Time: 02:43
Sample (adjusted): 2018 2024
Included observations: 7 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-48.85094	39.16813	-1.247211	0.4302
D(Y(-1))	75.28098	15.41622	4.883233	0.1286
D(Y(-2))	5.259936	64.65433	0.081355	0.9483
D(X(-1))	-0.799817	0.936699	-0.853867	0.5501
D(X(-2))	-0.328406	0.986562	-0.332879	0.7954
D(X(-3))	0.077573	0.875144	0.088640	0.9437
R-squared	0.997202	Mean dependent var	0.357143	
Adjusted R-squared	0.983214	S.D. dependent var	20.29243	
S.E. of regression	2.629083	Akaike info criterion	4.539523	
Sum squared resid	6.912078	Schwarz criterion	4.493160	
Log likelihood	-9.888330	Hannan-Quinn criter.	3.966488	
F-statistic	71.28926	Durbin-Watson stat	2.846756	
Prob(F-statistic)	0.089668			

LAMPIRAN 12 Uji *Lag Optimum* untuk Data X (PDB)

(Jumlah Lag $dX=1$ dan Jumlah Lag $dY=3$)

Dependent Variable: D(X)
 Method: Least Squares
 Date: 11/21/25 Time: 02:44
 Sample (adjusted): 2016 2024
 Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.701138	20.70577	-0.082158	0.9385
D(Y(-1))	66.17170	13.30344	4.974030	0.0076
D(Y(-2))	-26.93077	33.32188	-0.808201	0.4643
D(Y(-3))	-36.28623	41.61167	-0.872021	0.4324
D(X(-1))	-0.587013	0.535575	-1.096042	0.3346
R-squared	0.987058	Mean dependent var	0.178889	
Adjusted R-squared	0.974117	S.D. dependent var	17.57759	
S.E. of regression	2.827929	Akaike info criterion	5.217147	
Sum squared resid	31.98873	Schwarz criterion	5.326716	
Log likelihood	-18.47716	Hannan-Quinn criter.	4.980697	
F-statistic	76.27014	Durbin-Watson stat	1.326100	
Prob(F-statistic)	0.000498			

LAMPIRAN 13 Uji *Lag Optimum* untuk Data X (PDB)

(Jumlah Lag $dX=2$ dan Jumlah Lag $d^2Y=3$)

Dependent Variable: D(X)

Method: Least Squares

Date: 11/21/25 Time: 02:45

Sample (adjusted): 2017 2024

Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-37.37309	40.82493	-0.915448	0.4566
D(Y(-1))	75.77188	11.71550	6.467663	0.0231
D(Y(-2))	-24.53707	40.29676	-0.608909	0.6045
D(Y(-3))	10.33475	45.43097	0.227482	0.8412
D(X(-1))	-0.448112	0.536099	-0.835874	0.4912
D(X(-2))	-0.270581	0.367136	-0.737006	0.5379
R-squared	0.995876	Mean dependent var	0.281250	
Adjusted R-squared	0.985565	S.D. dependent var	18.78837	
S.E. of regression	2.257327	Akaike info criterion	4.579945	
Sum squared resid	10.19105	Schwarz criterion	4.639526	
Log likelihood	-12.31978	Hannan-Quinn criter.	4.178094	
F-statistic	96.58782	Durbin-Watson stat	2.808116	
Prob(F-statistic)	0.010279			

LAMPIRAN 14 Uji *Lag Optimum* untuk Data X (PDB)

(Jumlah Lag $dX=1$ dan Jumlah Lag $dY=4$)

Dependent Variable: D(X)

Method: Least Squares

Date: 11/21/25 Time: 02:47

Sample (adjusted): 2016 2024

Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-140.4456	56.83664	-2.471039	0.0900
D(Y(-1))	86.66619	11.93467	7.261719	0.0054
D(Y(-2))	24.64950	29.96053	0.822733	0.4710
D(Y(-3))	39.22744	40.56646	0.966992	0.4049
D(Y(-4))	77.31659	30.75736	2.513759	0.0867
D(X(-1))	-0.586387	0.350886	-1.671159	0.1933
R-squared	0.995834	Mean dependent var	0.178889	
Adjusted R-squared	0.988890	S.D. dependent var	17.57759	
S.E. of regression	1.852739	Akaike info criterion	4.305928	
Sum squared resid	10.29793	Schwarz criterion	4.437411	
Log likelihood	-13.37668	Hannan-Quinn criter.	4.022188	
F-statistic	143.4158	Durbin-Watson stat	0.412283	
Prob(F-statistic)	0.000910			

LAMPIRAN 15 Uji *Lag Optimum* untuk Data X (PDB)

(Jumlah Lag $dX=2$ dan Jumlah Lag $dY=4$)

Dependent Variable: D(X)

Method: Least Squares

Date: 11/21/25 Time: 02:48

Sample (adjusted): 2017 2024

Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-114.3265	60.66840	-1.884449	0.3106
D(Y(-1))	87.23255	11.98526	7.278320	0.0869
D(Y(-2))	-4.094756	34.51177	-0.118648	0.9248
D(Y(-3))	34.35563	39.17166	0.877053	0.5416
D(Y(-4))	68.71325	45.96685	1.494844	0.3753
D(X(-1))	-0.273902	0.437366	-0.626255	0.6438
D(X(-2))	0.154106	0.405039	0.380471	0.7686
R-squared	0.998725	Mean dependent var		0.281250
Adjusted R-squared	0.991075	S.D. dependent var		18.78837
S.E. of regression	1.775015	Akaike info criterion		3.656053
Sum squared resid	3.150678	Schwarz criterion		3.725565
Log likelihood	-7.624213	Hannan-Quinn criter.		3.187227
F-statistic	130.5469	Durbin-Watson stat		1.033841
Prob(F-statistic)	0.066895			

LAMPIRAN 16 Uji *Lag Optimum* untuk Data Y (IPM)

(Jumlah Lag dY=1 dan Jumlah Lag dX=1)

Dependent Variable: D(Y)

Method: Least Squares

Date: 11/21/25 Time: 02:50

Sample (adjusted): 2016 2024

Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.026024	0.218881	4.687578	0.0034
D(X(-1))	-0.001739	0.002793	-0.622612	0.5564
D(Y(-1))	-0.685003	0.351784	-1.947228	0.0994
R-squared	0.390854	Mean dependent var	0.607778	
Adjusted R-squared	0.187805	S.D. dependent var	0.138994	
S.E. of regression	0.125264	Akaike info criterion	-1.055580	
Sum squared resid	0.094147	Schwarz criterion	-0.989838	
Log likelihood	7.750109	Hannan-Quinn criter.	-1.197450	
F-statistic	1.924928	Durbin-Watson stat	2.428566	
Prob(F-statistic)	0.226029			

LAMPIRAN 17 Uji *Lag Optimum* untuk Data Y (IPM)

(Jumlah Lag $dY=2$ dan Jumlah Lag $dX=1$)

Dependent Variable: D(Y)

Method: Least Squares

Date: 11/21/25 Time: 09:27

Sample (adjusted): 2016 2024

Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.850043	0.610662	3.029569	0.0291
D(X(-1))	0.004931	0.005329	0.925196	0.3973
D(Y(-1))	-0.966103	0.379538	-2.545470	0.0515
D(Y(-2))	-1.078120	0.753991	-1.429884	0.2121
R-squared	0.567649	Mean dependent var	0.607778	
Adjusted R-squared	0.308238	S.D. dependent var	0.138994	
S.E. of regression	0.115605	Akaike info criterion	-1.176177	
Sum squared resid	0.066822	Schwarz criterion	-1.088521	
Log likelihood	9.292795	Hannan-Quinn criter.	-1.365337	
F-statistic	2.188221	Durbin-Watson stat	2.041989	
Prob(F-statistic)	0.207724			

LAMPIRAN 18 Uji *Lag Optimum* untuk Data Y (IPM)

(Jumlah Lag $dY=3$ dan Jumlah Lag $dX=1$)

Dependent Variable: D(Y)

Method: Least Squares

Date: 11/21/25 Time: 09:29

Sample (adjusted): 2016 2024

Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.840709	0.946330	1.945103	0.1237
D(X(-1))	0.005269	0.024478	0.215244	0.8401
D(Y(-1))	-0.959901	0.608016	-1.578742	0.1895
D(Y(-2))	-1.096186	1.522933	-0.719786	0.5115
D(Y(-3))	0.027088	1.901807	0.014243	0.9893
R-squared	0.567670	Mean dependent var	0.607778	
Adjusted R-squared	0.135341	S.D. dependent var	0.138994	
S.E. of regression	0.129247	Akaike info criterion	-0.954005	
Sum squared resid	0.066819	Schwarz criterion	-0.844436	
Log likelihood	9.293023	Hannan-Quinn criter.	-1.190455	
F-statistic	1.313050	Durbin-Watson stat	2.044910	
Prob(F-statistic)	0.399114			

LAMPIRAN 19 Uji *Lag Optimum* untuk Data Y (PDB)

(Jumlah Lag $dY=4$ dan Jumlah Lag $dX=1$)

Dependent Variable: D(Y)

Method: Least Squares

Date: 11/21/25 Time: 09:32

Sample (adjusted): 2016 2024

Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.003763	3.851592	1.558774	0.2169
D(X(-1))	0.005250	0.023778	0.220787	0.8394
D(Y(-1))	-1.574842	0.808765	-1.947219	0.1467
D(Y(-2))	-2.643862	2.030305	-1.302199	0.2838
D(Y(-3))	-2.238715	2.749027	-0.814366	0.4751
D(Y(-4))	-2.319899	2.084304	-1.113033	0.3469
R-squared	0.694023	Mean dependent var	0.607778	
Adjusted R-squared	0.184061	S.D. dependent var	0.138994	
S.E. of regression	0.125553	Akaike info criterion	-1.077461	
Sum squared resid	0.047290	Schwarz criterion	-0.945978	
Log likelihood	10.84857	Hannan-Quinn criter.	-1.361201	
F-statistic	1.360931	Durbin-Watson stat	1.257075	
Prob(F-statistic)	0.425438			

LAMPIRAN 20 Uji *Lag Optimum* untuk Data Y (IPM)

(Jumlah Lag $dY=1$ dan Jumlah Lag $dX=2$)

Dependent Variable: D(Y)

Method: Least Squares

Date: 11/21/25 Time: 09:33

Sample (adjusted): 2017 2024

Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.179445	0.281279	4.193154	0.0138
D(X(-1))	-0.007400	0.006445	-1.148277	0.3149
D(X(-2))	-0.006266	0.006367	-0.984168	0.3808
D(Y(-1))	-0.969119	0.469286	-2.065091	0.1078
R-squared	0.522548	Mean dependent var	0.605000	
Adjusted R-squared	0.164459	S.D. dependent var	0.148324	
S.E. of regression	0.135580	Akaike info criterion	-0.851659	
Sum squared resid	0.073528	Schwarz criterion	-0.811938	
Log likelihood	7.406635	Hannan-Quinn criter.	-1.119559	
F-statistic	1.459268	Durbin-Watson stat	2.302021	
Prob(F-statistic)	0.351736			

LAMPIRAN 21 Uji *Lag Optimum* untuk Data Y (IPM)

(Jumlah Lag $dY=2$ dan Jumlah Lag $dX=2$)

Dependent Variable: D(Y)

Method: Least Squares

Date: 11/21/25 Time: 09:55

Sample (adjusted): 2017 2024

Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.327072	1.582165	1.470815	0.2377
D(X(-1))	0.015705	0.032021	0.490459	0.6574
D(X(-2))	0.006437	0.018480	0.348315	0.7506
D(Y(-1))	-0.919872	0.502891	-1.829167	0.1648
D(Y(-2))	-1.897606	2.569051	-0.738641	0.5137
R-squared	0.596018	Mean dependent var		0.605000
Adjusted R-squared	0.057374	S.D. dependent var		0.148324
S.E. of regression	0.144006	Akaike info criterion		-0.768751
Sum squared resid	0.062213	Schwarz criterion		-0.719100
Log likelihood	8.075005	Hannan-Quinn criter.		-1.103627
F-statistic	1.106517	Durbin-Watson stat		1.888831
Prob(F-statistic)	0.486328			

LAMPIRAN 22 Uji *Lag Optimum* untuk Data Y (IPM)

(Jumlah Lag $dY=3$ dan Jumlah Lag $dX=2$)

Dependent Variable: D(Y)

Method: Least Squares

Date: 11/21/25 Time: 09:59

Sample (adjusted): 2017 2024

Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.189996	3.095878	1.030401	0.4111
D(X(-1))	0.010694	0.040654	0.263058	0.8171
D(X(-2))	0.012439	0.027841	0.446782	0.6988
D(Y(-1))	-1.150496	0.888422	-1.294989	0.3247
D(Y(-2))	-1.858850	3.055825	-0.608297	0.6049
D(Y(-3))	-1.208927	3.445168	-0.350905	0.7592
R-squared	0.619447	Mean dependent var		0.605000
Adjusted R-squared	-0.331935	S.D. dependent var		0.148324
S.E. of regression	0.171180	Akaike info criterion		-0.578497
Sum squared resid	0.058605	Schwarz criterion		-0.518916
Log likelihood	8.313990	Hannan-Quinn criter.		-0.980348
F-statistic	0.651102	Durbin-Watson stat		1.865491
Prob(F-statistic)	0.697997			

LAMPIRAN 23 Uji *Lag Optimum* untuk Data Y (IPM)

(Jumlah Lag $dY=4$ dan Jumlah Lag $dX=2$)

Dependent Variable: D(Y)

Method: Least Squares

Date: 11/21/25 Time: 09:59

Sample (adjusted): 2017 2024

Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.367787	7.378201	0.863054	0.5467
D(X(-1))	0.003500	0.053190	0.065809	0.9582
D(X(-2))	-0.005099	0.049259	-0.103505	0.9343
D(Y(-1))	-1.623764	1.457590	-1.114006	0.4657
D(Y(-2))	-2.703015	4.197156	-0.644011	0.6358
D(Y(-3))	-2.200869	4.763870	-0.461992	0.7245
D(Y(-4))	-2.837513	5.590268	-0.507581	0.7010
R-squared	0.697407	Mean dependent var	0.605000	
Adjusted R-squared	-1.118153	S.D. dependent var	0.148324	
S.E. of regression	0.215869	Akaike info criterion	-0.557733	
Sum squared resid	0.046599	Schwarz criterion	-0.488222	
Log likelihood	9.230932	Hannan-Quinn criter.	-1.026559	
F-statistic	0.384128	Durbin-Watson stat	1.033841	
Prob(F-statistic)	0.842232			

LAMPIRAN 24 Uji *Lag Optimum* untuk Data Y (IPM)

(Jumlah Lag $dY=1$ dan Jumlah Lag $dX=3$)

Dependent Variable: D(Y)

Method: Least Squares

Date: 11/21/25 Time: 10:01

Sample (adjusted): 2018 2024

Included observations: 7 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.620959	0.562638	2.880998	0.1023
D(X(-1))	-0.029278	0.024048	-1.217477	0.3476
D(X(-2))	-0.051098	0.047823	-1.068471	0.3972
D(X(-3))	-0.047818	0.050858	-0.940214	0.4464
D(Y(-1))	-1.668874	0.896189	-1.862190	0.2036
R-squared	0.685116	Mean dependent var	0.601429	
Adjusted R-squared	0.055348	S.D. dependent var	0.159836	
S.E. of regression	0.155350	Akaike info criterion	-0.710464	
Sum squared resid	0.048267	Schwarz criterion	-0.749100	
Log likelihood	7.486625	Hannan-Quinn criter.	-1.187993	
F-statistic	1.087887	Durbin-Watson stat	2.658273	
Prob(F-statistic)	0.530616			

LAMPIRAN 25 Uji *Lag Optimum* untuk Data Y (IPM)

(Jumlah Lag $dY=2$ dan Jumlah Lag $dX=3$)

Dependent Variable: D(Y)

Method: Least Squares

Date: 11/21/25 Time: 10:01

Sample (adjusted): 2018 2024

Included observations: 7 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.194505	1.916719	2.188378	0.2729
D(X(-1))	0.027869	0.045838	0.607990	0.6522
D(X(-2))	-0.012884	0.048278	-0.266863	0.8340
D(X(-3))	-0.037095	0.042826	-0.866175	0.5456
D(Y(-1))	-1.481777	0.754403	-1.964171	0.2998
D(Y(-2))	-4.379502	3.163903	-1.384209	0.3983
R-squared	0.892016	Mean dependent var	0.601429	
Adjusted R-squared	0.352098	S.D. dependent var	0.159836	
S.E. of regression	0.128656	Akaike info criterion	-1.494974	
Sum squared resid	0.016552	Schwarz criterion	-1.541337	
Log likelihood	11.23241	Hannan-Quinn criter.	-2.068009	
F-statistic	1.652132	Durbin-Watson stat	2.846756	
Prob(F-statistic)	0.528238			

LAMPIRAN 26 UJI KAUSALITAS GRANGER VARIABEL

DEPENDEN (dX)

Dependent Variable: D(X)
 Method: Least Squares
 Date: 11/21/25 Time: 02:48
 Sample (adjusted): 2017 2024
 Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-114.3265	60.66840	-1.884449	0.3106
D(Y(-1))	87.23255	11.98526	7.278320	0.0869
D(Y(-2))	-4.094756	34.51177	-0.118648	0.9248
D(Y(-3))	34.35563	39.17166	0.877053	0.5416
D(Y(-4))	68.71325	45.96685	1.494844	0.3753
D(X(-1))	-0.273902	0.437366	-0.626255	0.6438
D(X(-2))	0.154106	0.405039	0.380471	0.7686
R-squared	0.998725	Mean dependent var		0.281250
Adjusted R-squared	0.991075	S.D. dependent var		18.78837
S.E. of regression	1.775015	Akaike info criterion		3.656053
Sum squared resid	3.150678	Schwarz criterion		3.725565
Log likelihood	-7.624213	Hannan-Quinn criter.		3.187227
F-statistic	130.5469	Durbin-Watson stat		1.033841
Prob(F-statistic)	0.066895			

Dependent Variable: D(X)
 Method: Least Squares
 Date: 12/07/25 Time: 22:21
 Sample (adjusted): 2017 2024
 Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.449538	3.466708	-0.418131	0.6932
D(X(-1))	-1.464407	0.335923	-4.359358	0.0073
D(X(-2))	-0.953538	0.367785	-2.592652	0.0487
R-squared	0.814169	Mean dependent var		0.281250
Adjusted R-squared	0.739837	S.D. dependent var		18.78837
S.E. of regression	9.583234	Akaike info criterion		7.637904
Sum squared resid	459.1918	Schwarz criterion		7.667694
Log likelihood	-27.55161	Hannan-Quinn criter.		7.436978
F-statistic	10.95309	Durbin-Watson stat		2.287477
Prob(F-statistic)	0.014887			

LAMPIRAN 27 UJI KAUSALITAS GRANGER VARIABEL

DEPENDEN (dY_t)

Dependent Variable: D(Y)
 Method: Least Squares
 Date: 12/17/25 Time: 09:30
 Sample (adjusted): 2018 2024
 Included observations: 7 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.194505	1.916719	2.188378	0.2729
D(X(-1))	0.027869	0.045838	0.607990	0.6522
D(X(-2))	-0.012884	0.048278	-0.266863	0.8340
D(X(-3))	-0.037095	0.042826	-0.866175	0.5456
D(Y(-1))	-1.481777	0.754403	-1.964171	0.2998
D(Y(-2))	-4.379502	3.163903	-1.384209	0.3983
R-squared	0.892016	Mean dependent var	0.601429	
Adjusted R-squared	0.352098	S.D. dependent var	0.159836	
S.E. of regression	0.128656	Akaike info criterion	-1.494974	
Sum squared resid	0.016552	Schwarz criterion	-1.541337	
Log likelihood	11.23241	Hannan-Quinn criter.	-2.068009	
F-statistic	1.652132	Durbin-Watson stat	2.846756	
Prob(F-statistic)	0.528238			

Dependent Variable: D(Y)
 Method: Least Squares
 Date: 12/17/25 Time: 09:30
 Sample (adjusted): 2014 2024
 Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.427449	0.341941	4.174552	0.0031
D(Y(-1))	-0.874490	0.313624	-2.788334	0.0236
D(Y(-2))	-0.470299	0.313771	-1.498863	0.1723
R-squared	0.494191	Mean dependent var	0.610000	
Adjusted R-squared	0.367738	S.D. dependent var	0.125140	
S.E. of regression	0.099505	Akaike info criterion	-1.550219	
Sum squared resid	0.079210	Schwarz criterion	-1.441703	
Log likelihood	11.52621	Hannan-Quinn criter.	-1.618624	
F-statistic	3.908117	Durbin-Watson stat	2.327136	
Prob(F-statistic)	0.065456			