

LAMPIRAN

LAMPIRAN 1 INDONESIA - AUSTRALIA

quarter	gr_ta	gr_trade	gr_gdp	gr_er
2008q1				
2008q2	23.1355282	3.328490376	4.82408882	4.231987395
2008q3	25.2892728	10.17096986	0.289820199	-6.44754924
2008q4	-8.8112684	-9.455363526	4.48124244	-10.261966
2009q1	-12.686049	-12.60286886	-7.232451197	4.863564644
2009q2	40.6687677	42.9546322	4.746303075	3.987997416
2009q3	18.6596329	-11.04269241	0.081502322	3.870916627
2009q4	0.58029763	6.008368426	5.105273748	3.555241532
2010q1	-9.6564091	-5.618236194	-7.707426174	-2.7094083
2010q2	24.7454162	4.909683893	5.742328804	-3.7873958
2010q3	17.2648126	4.196110327	-0.029171955	1.190678335
2010q4	-4.3933254	18.13705978	5.234791255	8.785924186
2011q1	-11.041599	-10.40249308	-8.194301438	0.934909951
2011q2	21.768918	-4.938524043	6.083122064	2.044832753
2011q3	20.5528193	11.15467556	0.561025733	-1.21889748
2011q4	-11.806656	10.17691629	5.426469934	0.757668201
2012q1	-12.160703	-13.98664094	-6.896761072	5.403987023
2012q2	8.50990954	2.03979982	5.96136636	-2.15975126
2012q3	10.4935896	-2.798878201	-0.279930881	5.374262471
2012q4	-1.0730512	11.11279419	4.513413336	1.22793035
2013q1	-14.834784	-27.60825357	-7.444563256	0.603848617
2013q2	12.991314	43.97557161	5.547518293	-3.65141898
2013q3	5.73421744	-4.600131496	-0.065897624	0.827416252
2013q4	4.25569967	8.41605741	5.006486404	10.79376133
2014q1	-8.0610396	-4.800959409	-7.010276899	-1.93396125
2014q2	14.2927257	14.17843106	5.234315099	2.180087342
2014q3	11.4545293	13.38183528	-0.023170771	0.137441618
2014q4	-3.4513503	-10.94007259	4.309156309	-3.45957332
2015q1	-12.176299	-7.68241609	-6.682493736	-3.89937947
2015q2	2.79467652	39.60367102	4.941686289	1.421815065
2015q3	2.78116712	-20.76680494	0.488719698	-1.5878869
2015q4	-4.5122216	4.182942408	4.29006044	-1.4152179
2016q1	2.92348466	-4.998768804	-6.544761294	-1.55661916

2016q2	20.1207207	21.11049656	5.579507958	1.656057919
2016q3	6.84950066	-5.958812053	-0.944468821	0.332067355
2016q4	-4.5470299	8.388862753	5.036916246	-0.26330071
2017q1	-12.255501	-10.86061634	-7.21621383	2.041769108
2017q2	6.84165551	20.68038955	5.619565125	-1.26756437
2017q3	12.3643623	5.244994006	-0.133660628	5.347713028
2017q4	-20.055207	-14.29919355	4.204349084	-1.21771767
2018q1	-2.5263342	-2.981846153	-6.283983302	2.590716732
2018q2	18.0024311	0.247298701	-5.835116216	-1.0929303
2018q3	11.6823669	2.967927405	-7.103458657	1.183936352
2018q4	-10.339464	0.663883153	-7.766708254	-0.73325221

- Uji Stasioneritas

```
. dfuller gr_ta, lags(2)
Augmented Dickey-Fuller test for unit root      Number of obs =      40

              Test Statistic      Interpolated Dickey-Fuller
              1% Critical Value      5% Critical Value      10% Critical Value
-----
Z(t)          -5.034          -3.648          -2.958          -2.612

MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller gr_trade, lags(2)
Augmented Dickey-Fuller test for unit root      Number of obs =      40

              Test Statistic      Interpolated Dickey-Fuller
              1% Critical Value      5% Critical Value      10% Critical Value
-----
Z(t)          -7.177          -3.648          -2.958          -2.612

MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller gr_gdp, lags(2)
Augmented Dickey-Fuller test for unit root      Number of obs =      40

              Test Statistic      Interpolated Dickey-Fuller
              1% Critical Value      5% Critical Value      10% Critical Value
-----
Z(t)          -3.775          -3.648          -2.958          -2.612

MacKinnon approximate p-value for Z(t) = 0.0032
```

```
. dfuller gr_er, lags(2)

Augmented Dickey-Fuller test for unit root      Number of obs   =      40

                Test Statistic          Interpolated Dickey-Fuller
                -----
                1% Critical Value      5% Critical Value      10% Critical Value
-----
Z(t)          -5.868                -3.648                -2.958                -2.612
-----
MacKinnon approximate p-value for Z(t) = 0.0000
```

- Uji Lag Optimum

```
varsoc gr_ta gr_trade gr_gdp gr_er

Selection-order criteria
Sample: 2009q2 - 2018q4      Number of obs   =      39
```

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-664.066				8.9e+09	34.2598	34.321	34.4304*
1	-650.753	26.627	16	0.046	1.0e+10	34.3976	34.7037	35.2507
2	-622.498	56.51	16	0.000	5.6e+09*	33.7691*	34.3201*	35.3047
3	-611.746	21.504	16	0.160	7.9e+09	34.0383	34.8341	36.2563
4	-593.251	36.99*	16	0.002	8.0e+09	33.9103	34.951	36.8109

```
Endogenous: gr_ta gr_trade gr_gdp gr_er
Exogenous: _cons
```

- Estimasi VAR

```
. var gr_ta gr_trade gr_gdp gr_er, lags(2)
```

Vector autoregression

```
Sample: 2008q4 - 2018q4          Number of obs   =      41
Log likelihood = -679.5732       AIC              =    34.12552
FPE            =  7.81e+09       HQIC             =    34.42991
Det(Sigma_ml) =  2.93e+09       SBIC             =    34.96141
```

Equation	Parms	RMSE	R-sq	chi2	P>chi2
gr_ta	5	10.1689	0.4809	37.98877	0.0000
gr_trade	5	15.2684	0.1457	6.99086	0.1364
gr_gdp	5	151.885	0.0889	3.999511	0.4061
gr_er	5	3.77341	0.0645	2.828881	0.5869

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gr_ta						
gr_ta						
L2.	-.7358638	.1272818	-5.78	0.000	-.9853315	-.4863961
gr_trade						
L2.	.1421833	.1127114	1.26	0.207	-.0787271	.3630936
gr_gdp						
L2.	-.0007446	.0101094	-0.07	0.941	-.0205586	.0190694
gr_er						
L2.	-.0158175	.3916336	-0.04	0.968	-.7834053	.7517703
_cons	6.051051	1.590815	3.80	0.000	2.933111	9.16899
gr_trade						
gr_ta						
L2.	-.3160955	.1911112	-1.65	0.098	-.6906666	.0584756
gr_trade						
L2.	.2055649	.1692341	1.21	0.224	-.1261279	.5372577
gr_gdp						

L2.	.0084781	.015179	0.56	0.576	-.0212722	.0382285
gr_er L2.	-1.107725	.5880306	-1.88	0.060	-2.260244	.0447934
_cons	3.935305	2.388579	1.65	0.099	-.7462228	8.616834
gr_gdp						
gr_ta L2.	-3.660526	1.901107	-1.93	0.054	-7.386628	.0655752
gr_trade L2.	2.442597	1.683481	1.45	0.147	-.8569663	5.74216
gr_gdp L2.	.0109528	.1509957	0.07	0.942	-.2849933	.3068988
gr_er L2.	.4098593	5.849522	0.07	0.944	-11.05499	11.87471
_cons	29.83002	23.76074	1.26	0.209	-16.74018	76.40021
gr_er						
gr_ta L2.	-.0018565	.0472308	-0.04	0.969	-.0944271	.0907142
gr_trade L2.	.0351891	.0418241	0.84	0.400	-.0467847	.1171629
gr_gdp L2.	-.0007589	.0037513	-0.20	0.840	-.0081114	.0065935
gr_er L2.	-.213806	.1453245	-1.47	0.141	-.4986369	.0710249
_cons	.7656603	.5903079	1.30	0.195	-.3913219	1.922642

- Uji kausalitas Granger

```
vargranger
```

```
Granger causality Wald tests
```

Equation	Excluded	chi2	df	Prob > chi2
gr_ta	gr_trade	1.5913	1	0.207
gr_ta	gr_gdp	.00542	1	0.941
gr_ta	gr_er	.00163	1	0.968
gr_ta	ALL	1.6024	3	0.659
gr_trade	gr_ta	2.7357	1	0.098
gr_trade	gr_gdp	.31197	1	0.576
gr_trade	gr_er	3.5487	1	0.060
gr_trade	ALL	6.9339	3	0.074
gr_gdp	gr_ta	3.7074	1	0.054
gr_gdp	gr_trade	2.1052	1	0.147
gr_gdp	gr_er	.00491	1	0.944
gr_gdp	ALL	3.9951	3	0.262
gr_er	gr_ta	.00155	1	0.969
gr_er	gr_trade	.70789	1	0.400
gr_er	gr_gdp	.04093	1	0.840

gr_er	ALL	.95058	3	0.813
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- Uji Autokorelasi

```
varlmar, mlag(5)
```

```
Lagrange-multiplier test
```

lag	chi2	df	Prob > chi2
1	21.7175	16	0.15255
2	26.6373	16	0.04570
3	11.6687	16	0.76646
4	23.5978	16	0.09866
5	9.3311	16	0.89915

```
H0: no autocorrelation at lag order
```

- Uji Heteroskedastisitas

```
. varhet
```

```
White VAR residual heteroskedasticity test  
(No cross terms: Only levels and squares)
```

```
chi2          = 175.679  
df            = 160  
Prob > chi2   = 0.188
```

- Uji Multikolinearitas

```
. correlate gr_ta gr_trade gr_gdp gr_er  
(obs=43)
```

	gr_ta	gr_trade	gr_gdp	gr_er
gr_ta	1.0000			
gr_trade	0.5162	1.0000		
gr_gdp	0.0785	0.0265	1.0000	
gr_er	0.0750	0.1004	-0.1285	1.0000

LAMPIRAN 2 INDONESIA - CINA

quarter	gr_ta	gr_trade	gr_gdp	gr_er
2008q1				
2008q2	-13.121	-0.2241	10.1602	4.04153
2008q3	14.7787	6.74992	1.85617	-2.2209
2008q4	7.90873	-36.063	7.91086	7.06939
2009q1	13.7244	-15.939	-12.16	-1.5508
2009q2	-14.082	61.915	12.0736	-10.496
2009q3	28.9812	46.5692	4.12447	-7.2611
2009q4	-3.3499	46.3728	9.13587	-5.2605
2010q1	13.5106	0.43008	-11.905	-1.0692
2010q2	-10.768	-3.7772	10.6493	-1.6136
2010q3	13.6679	-11.297	3.32686	-3.1731
2010q4	-10.022	39.3744	9.16149	0.07676
2011q1	17.5716	-16.292	11.3506	-0.385
2011q2	-7.6517	43.3206	11.538	-2.2926
2011q3	27.3745	12.8991	4.45029	-0.4267
2011q4	-11.313	21.0144	10.2549	3.75504
2012q1	35.489	-20.326	-15.823	-0.5183
2012q2	-24.858	6.09122	11.0521	0.83537
2012q3	20.5931	-36.897	4.34466	0.05029
2012q4	1.45643	88.1651	10.8568	2.35084
2013q1	17.7557	-1.6392	-16.035	-0.4217
2013q2	-10.512	-2.5972	10.7518	1.00368
2013q3	22.4299	-2.0048	4.70293	4.79356
2013q4	-16.534	32.6454	10.6269	10.6097
2014q1	39.0256	-47.528	-16.298	-0.4869
2014q2	-21.706	-27.418	10.8639	-4.1597
2014q3	36.1127	-18.17	4.36248	0.58443
2014q4	-13.732	14.3969	10.7289	1.84334
2015q1	29.5878	-6.2179	-16.498	1.2806
2015q2	-18.199	-15.565	10.8738	2.03369
2015q3	33.2028	13.3124	4.24035	1.84921
2015q4	-22.437	0.41192	10.6846	-2.6818
2016q1	37.7959	-1.2711	-5.1039	-5.5536
2016q2	-12.559	22.1432	11.3478	-1.3963
2016q3	30.4021	19.1476	4.69547	-4.3352
2016q4	-12.161	13.3441	9.20839	-2.1818

2017q1	42.542	-29.413	-16.073	-0.5878
2017q2	-9.2364	12.7364	11.3074	-0.2299
2017q3	28.1265	25.5384	4.62599	2.63609
2017q4	-38.787	0.70387	9.12386	2.60957
2018q1	26.1253	13.0664	-15.926	2.87105
2018q2	11.0172	-6.8463	11.1453	1.64747
2018q3	15.5923	-3.5839	4.39373	-2.7651
2018q4	-29.206	10.9728	9.02214	-1.4838

- Uji Stasioneritas

```
. dfuller gr_ta,lags(1)
Augmented Dickey-Fuller test for unit root      Number of obs   =      41

              Test              Interpolated Dickey-Fuller
              Statistic          1% Critical      5% Critical      10% Critical
              Value              Value              Value              Value
-----
Z(t)          -5.303            -3.641            -2.955            -2.611
-----
MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller gr_trade,lags(1)
Augmented Dickey-Fuller test for unit root      Number of obs   =      41

              Test              Interpolated Dickey-Fuller
              Statistic          1% Critical      5% Critical      10% Critical
              Value              Value              Value              Value
-----
Z(t)          -4.484            -3.641            -2.955            -2.611
-----
MacKinnon approximate p-value for Z(t) = 0.0002

. dfuller gr_gdp,lags(1)
Augmented Dickey-Fuller test for unit root      Number of obs   =      41

              Test              Interpolated Dickey-Fuller
              Statistic          1% Critical      5% Critical      10% Critical
              Value              Value              Value              Value
-----
Z(t)          -5.780            -3.641            -2.955            -2.611
-----
MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller gr_er,lags(1)
Augmented Dickey-Fuller test for unit root      Number of obs   =      41

              Test              Interpolated Dickey-Fuller
              Statistic          1% Critical      5% Critical      10% Critical
              Value              Value              Value              Value
-----
Z(t)          -3.865            -3.641            -2.955            -2.611
-----
MacKinnon approximate p-value for Z(t) = 0.0023
```


- Uji Lag Optimum

```
varsoc gr_ta gr_trade gr_gdp gr_er
```

```
Selection-order criteria
```

```
Sample: 2009q2 - 2018q4
```

```
Number of obs = 39
```

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-592.836				2.3e+08	30.607	30.6682	30.7776
1	-549.564	86.544	16	0.000	5.7e+07	29.2084	29.5145*	30.0615*
2	-533.209	32.711	16	0.008	5.8e+07	29.1902	29.7411	30.7258
3	-512.75	40.918	16	0.001	4.9e+07*	28.9615	29.7574	31.1796
4	-495.499	34.503*	16	0.005	5.4e+07	28.8974*	29.9381	31.7979

```
Endogenous: gr_ta gr_trade gr_gdp gr_er
```

```
Exogenous: _cons
```

- Estimasi VAR

```
. var gr_ta gr_trade gr_gdp gr_er, lags(1)
```

```
Vector autoregression
```

```
Sample: 2008q3 - 2018q4
```

```
Number of obs = 42
```

```
Log likelihood = -596.8448
```

```
AIC = 29.37356
```

```
FPE = 6.74e+07
```

```
HQIC = 29.67686
```

```
Det(Sigma_ml) = 2.59e+07
```

```
SBIC = 30.20102
```

Equation	Parms	RMSE	R-sq	chi2	P>chi2
gr_ta	5	11.7935	0.7436	121.7807	0.0000
gr_trade	5	24.8637	0.2491	13.93559	0.0075
gr_gdp	5	7.06451	0.5334	48.00719	0.0000
gr_er	5	3.50609	0.1707	8.646948	0.0706

		Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gr_ta							
	gr_ta L1.	-.829868	.1097326	-7.56	0.000	-1.04494	-.614796
	gr_trade L1.	.0449741	.0704623	0.64	0.523	-.0931294	.1830776
	gr_gdp L1.	.104304	.2497536	0.42	0.676	-.385204	.5938121
	gr_er L1.	.0743124	.4792175	0.16	0.877	-.8649366	1.013562
	_cons	11.8042	2.268611	5.20	0.000	7.357804	16.2506
gr_trade							
	gr_ta L1.	.4952107	.2313447	2.14	0.032	.0417834	.9486381
	gr_trade L1.	-.1563624	.1485527	-1.05	0.293	-.4475202	.1347955
	gr_gdp L1.	.9077749	.5265452	1.72	0.085	-.1242347	1.939785
	gr_er L1.	-2.785523	1.010315	-2.76	0.006	-4.765703	-.8053429
	_cons	-.5136251	4.78282	-0.11	0.914	-9.88778	8.86053
gr_gdp							
	gr_ta L1.	.2267693	.0657318	3.45	0.001	.0979373	.3556013
	gr_trade L1.	-.0883716	.0422082	-2.09	0.036	-.1710981	-.0056451
	gr_gdp L1.	-.0519273	.1496069	-0.35	0.729	-.3451514	.2412969
	gr_er L1.	-.8359706	.2870599	-2.91	0.004	-1.398598	-.2733435
	_cons	2.464114	1.358939	1.81	0.070	-.1993577	5.127586
gr_er							
	gr_ta L1.	.0343946	.0326224	1.05	0.292	-.0295442	.0983334
	gr_trade L1.	-.0058993	.0209477	-0.28	0.778	-.0469561	.0351576
	gr_gdp L1.	.0605583	.0742493	0.82	0.415	-.0849677	.2060843
	gr_er L1.	.383141	.1424667	2.69	0.007	.1039113	.6623706
	_cons	-.6892474	.6744362	-1.02	0.307	-2.011118	.6326232

- Uji kausalitas Granger

```
vargranger
```

```
Granger causality Wald tests
```

Equation	Excluded	chi2	df	Prob > chi2
gr_ta	gr_trade	.40739	1	0.523
gr_ta	gr_gdp	.17441	1	0.676
gr_ta	gr_er	.02405	1	0.877
gr_ta	ALL	.79362	3	0.851
gr_trade	gr_ta	4.5821	1	0.032
gr_trade	gr_gdp	2.9722	1	0.085
gr_trade	gr_er	7.6015	1	0.006
gr_trade	ALL	13.638	3	0.003
gr_gdp	gr_ta	11.902	1	0.001
gr_gdp	gr_trade	4.3836	1	0.036
gr_gdp	gr_er	8.4808	1	0.004
gr_gdp	ALL	25.406	3	0.000
gr_er	gr_ta	1.1116	1	0.292
gr_er	gr_trade	.07931	1	0.778
gr_er	gr_gdp	.66522	1	0.415
gr_er	ALL	1.2244	3	0.747

- Uji Autokorelasi

```
varlmar, mlag(5)
```

```
Lagrange-multiplier test
```

lag	chi2	df	Prob > chi2
1	22.7284	16	0.12119
2	25.6797	16	0.05870
3	18.7826	16	0.28010
4	15.4491	16	0.49202
5	17.6639	16	0.34394

```
H0: no autocorrelation at lag order
```

- Uji Heteroskedastisitas

```
. varhet
```

```
White VAR residual heteroskedasticity test  
(No cross terms: Only levels and squares)
```

```
chi2          = 94.479  
df            = 80  
Prob > chi2   = 0.128
```

- Uji Multikolinearitas

```
. correlate gr_ta gr_trade gr_gdp gr_er  
(obs=43)
```

	gr_ta	gr_trade	gr_gdp	gr_er
gr_ta	1.0000			
gr_trade	-0.2794	1.0000		
gr_gdp	-0.6773	0.3900	1.0000	
gr_er	-0.0883	-0.1759	0.0405	1.0000

LAMPIRAN 3 INDONESIA - JEPANG

quarter	gr_ta	gr_trade	gr_gdp	gr_er
2008q1				
2008q2	-14.47093035	9.104221359	-3.479705188	0.514444604
2008q3	32.0069777	-4.815714585	0.880113519	-3.064462635
2008q4	-21.79070692	-5.211071923	0.853884663	33.1616129
2009q1	-7.173197118	-30.41806378	-7.122395937	8.47725355
2009q2	-14.0847919	9.639468194	-0.935001912	-12.77592207
2009q3	39.7388993	38.57934019	2.219674602	-1.322281916
2009q4	-12.09815538	-9.851128692	4.95184373	-1.192084459
2010q1	-18.10080491	6.917602105	-1.692289744	-3.014900432
2010q2	-8.3001833	-14.57375597	-1.669831286	-3.13244441
2010q3	29.51377444	5.461292151	4.167022865	6.018750905
2010q4	-19.77029612	15.569151	2.246247203	3.600832526
2011q1	8.485884147	-0.319506355	-3.723035495	-0.485221003
2011q2	-16.31578947	-3.961807401	-3.448853638	-2.651831533
2011q3	41.23103627	-8.56841994	4.801643637	5.136599219
2011q4	-17.74498615	2.642717853	2.728908792	4.793796582
2012q1	5.390615904	-2.280587932	-0.791248227	-1.344563412
2012q2	-5.652526145	-9.236374112	-3.701678258	1.194529805
2012q3	27.31548339	8.137047551	1.744744942	4.346662215
2012q4	-6.574288386	1.033645217	3.142566163	-2.020594896
2013q1	-1.229696473	4.973333874	-0.638083616	-11.34907318
2013q2	-7.168545112	-1.624403147	-2.305332883	-5.4982676
2013q3	25.72067639	-7.116793081	2.860166838	8.588625121
2013q4	-11.2498043	4.229006076	2.898142053	7.91860735
2014q1	-8.562264454	-5.870586026	-0.423656684	-0.962112001
2014q2	1.874035358	-9.020234071	-5.190525216	-1.104654025
2014q3	18.43348914	3.835217188	2.004586162	-0.801365571
2014q4	-0.139552125	-2.519491019	3.370678749	-5.183217485
2015q1	-2.36260017	3.026724602	0.043172231	0.436428385
2015q2	-16.74680383	-15.87310259	-3.132506849	0.590740316
2015q3	31.9385745	12.47333513	1.692707715	5.060822303
2015q4	-8.087601545	-1.229170245	2.379225719	-0.2525097
2016q1	-0.34260736	9.639667618	-0.468328541	3.592009785
2016q2	-11.97987671	-19.4379889	-3.212859686	4.94021281
2016q3	29.99183495	10.9957572	1.920069806	4.00444638
2016q4	-11.15917347	5.950295543	3.099293026	-5.501566787

2017q1	-3.918481588	-5.341016947	-0.249421683	-2.911480535
2017q2	-3.463055682	-15.48364492	-2.913457362	1.915200576
2017q3	45.72708342	21.95560886	2.297317832	0.283119094
2017q4	-30.55083718	-1.407819305	3.315007988	-0.184145719
2018q1	-4.841990838	-5.185650434	-1.394193915	4.564903312
2018q2	-11.68709304	-17.31947207	-2.674117833	1.955626412
2018q3	56.5429498	20.32733317	0.863275478	2.46540356
2018q4	-23.29603135	-8.267610066	4.23953887	-0.035608007

- Uji Stasioneritas

```
. dfuller gr_ta,lags(4)
```

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-3.070	-3.662	-2.964	-2.614

MacKinnon approximate p-value for Z(t) = 0.0289

```
. dfuller gr_trade,lags(4)
```

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-4.415	-3.662	-2.964	-2.614

MacKinnon approximate p-value for Z(t) = 0.0003

```
. dfuller gr_gdp,lags(4)
```

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-4.368	-3.662	-2.964	-2.614

MacKinnon approximate p-value for Z(t) = 0.0003

```
. dfuller gr_er,lags(4)
```

Augmented Dickey-Fuller test for unit root Number of obs = 38

	Test Statistic	Interpolated Dickey-Fuller		
		1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-5.021	-3.662	-2.964	-2.614

MacKinnon approximate p-value for Z(t) = 0.0000

- Uji Lag Optimum

```
varsoc gr_ta gr_trade gr_gdp gr_er
```

Selection-order criteria

Sample: 2009q2 - 2018q4

Number of obs = 39

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-520.294				5.6e+06	26.8869	26.9481	27.0575
1	-483.468	73.652	16	0.000	1.9e+06	25.8189	26.125	26.672
2	-434.893	97.149	16	0.000	373518	24.1484	24.6993	25.684
3	-395.839	78.109	16	0.000	123070	22.9661	23.7619*	25.1842*
4	-375.794	40.089*	16	0.001	115525*	22.7587*	23.7994	25.6593

Endogenous: gr_ta gr_trade gr_gdp gr_er

Exogenous: _cons

- Estimasi VAR

```
. var gr_ta gr_trade gr_gdp gr_er, lags(4)
```

Vector autoregression

Sample: 2009q2 - 2018q4

Number of obs = 39

Log likelihood = -453.3207

AIC = 24.27286

FPE = 411278.2

HQIC = 24.57895

Det(Sigma_ml) = 146636

SBIC = 25.12597

Equation	Parms	RMSE	R-sq	chi2	P>chi2
gr_ta	5	9.92708	0.8068	162.8612	0.0000
gr_trade	5	10.3942	0.3059	17.18991	0.0018
gr_gdp	5	1.35343	0.7873	144.3494	0.0000
gr_er	5	4.37044	0.1810	8.616553	0.0714

		Coef.	Std. Err.	z	P> z	[95% Conf. Intervall]	
gr_ta							
	gr_ta L4.	.884109	.0825347	10.71	0.000	.7223439	1.045874
	gr_trade L4.	.2743899	.1485022	1.85	0.065	-.016669	.5654488
	gr_gdp L4.	-.1491469	.583348	-0.26	0.798	-1.292488	.9941942
	gr_er L4.	.296972	.2192354	1.35	0.176	-.1327214	.7266654
	_cons	.6243459	1.505268	0.41	0.678	-2.325924	3.574616
gr_trade							
	gr_ta L4.	.2563091	.086418	2.97	0.003	.086933	.4256852
	gr_trade L4.	-.0095599	.1554892	-0.06	0.951	-.3143131	.2951934
	gr_gdp L4.	.9347166	.6107945	1.53	0.126	-.2624187	2.131852
	gr_er L4.	-.0958551	.2295504	-0.42	0.676	-.5457655	.3540554
	_cons	.0461989	1.57609	0.03	0.977	-3.042881	3.135279
gr_gdp							
	gr_ta L4.	-.0026974	.0112526	-0.24	0.811	-.024752	.0193573
	gr_trade L4.	.0383003	.0202464	1.89	0.059	-.0013819	.0779825
	gr_gdp L4.	.6732401	.0795321	8.47	0.000	.51736	.8291201
	gr_er L4.	.1325602	.02989	4.43	0.000	.0739769	.1911434
	_cons	.1939649	.2052242	0.95	0.345	-.2082671	.5961969
gr_er							
	gr_ta L4.	.0590714	.0363363	1.63	0.104	-.0121464	.1302892
	gr_trade L4.	-.0335926	.0653787	-0.51	0.607	-.1617326	.0945474
	gr_gdp L4.	.4791973	.2568216	1.87	0.062	-.0241637	.9825583
	gr_er L4.	-.0157395	.0965193	-0.16	0.870	-.2049139	.173435
	_cons	.0713453	.6627008	0.11	0.914	-1.227524	1.370215

- Uji Kausalitas Granger

```
vargranger
```

```
Granger causality Wald tests
```

Equation	Excluded	chi2	df	Prob > chi2
gr_ta	gr_trade	3.4141	1	0.065
gr_ta	gr_gdp	.06537	1	0.798
gr_ta	gr_er	1.8349	1	0.176
gr_ta	ALL	4.6881	3	0.196
gr_trade	gr_ta	8.7967	1	0.003
gr_trade	gr_gdp	2.3419	1	0.126
gr_trade	gr_er	.17437	1	0.676
gr_trade	ALL	13.127	3	0.004
gr_gdp	gr_ta	.05746	1	0.811
gr_gdp	gr_trade	3.5786	1	0.059
gr_gdp	gr_er	19.669	1	0.000
gr_gdp	ALL	20.55	3	0.000
gr_er	gr_ta	2.6429	1	0.104
gr_er	gr_trade	.26401	1	0.607
gr_er	gr_gdp	3.4815	1	0.062
gr_er	ALL	8.5841	3	0.035

- Uji Autokorelasi

```
varlmar, mlag(5)
```

```
Lagrange-multiplier test
```

lag	chi2	df	Prob > chi2
1	22.6082	16	0.12462
2	23.7064	16	0.09612
3	31.3299	16	0.01221
4	26.4637	16	0.04784
5	17.8692	16	0.33161

```
H0: no autocorrelation at lag order
```

- Uji Heteroskedastisitas

```
varhet
```

```
White VAR residual heteroskedasticity test  
(No cross terms: Only levels and squares)
```

```
chi2          = 318.749  
df            = 320  
Prob > chi2   = 0.509
```

- Uji Multiokolnearitas

```
. correlate gr_ta gr_trade gr_gdp gr_er  
(obs=43)
```

	gr_ta	gr_trade	gr_gdp	gr_er
gr_ta	1.0000			
gr_trade	0.4599	1.0000		
gr_gdp	0.2716	0.4247	1.0000	
gr_er	0.0343	-0.1438	0.0779	1.0000

LAMPIRAN 4 INDONESIA - SINGAPURA

quarter	gr_ta	gr_trade	gr_gdp	gr_er
2008q1				
2008q2	10.58301163	10.7538706	-1.837515522	2.610058131
2008q3	-5.719174018	-1.422742325	1.346380685	-4.356629449
2008q4	16.64481344	-17.08096271	-3.597378153	10.58872712
2009q1	-19.67967914	-7.970590052	-4.934566902	3.123970858
2009q2	11.52188273	-27.45126724	5.865887084	-7.510067602
2009q3	-16.51674564	16.79866697	5.681111882	-3.450569776
2009q4	29.00572418	68.64496893	-0.514786223	-2.906236338
2010q1	-15.69502964	-11.3563959	5.377896962	-3.207011923
2010q2	17.0247349	-4.951250236	7.445403426	-0.270421257
2010q3	-15.60433123	-9.867052936	-1.70842284	-0.447863797
2010q4	30.45644361	15.70474638	2.734033517	3.310166279
2011q1	-16.98862905	2.032352107	0.5957733	1.388790527
2011q2	22.71914317	11.16764448	2.104428237	0.337491198
2011q3	-15.2613622	11.69814722	2.056830383	1.30836405
2011q4	24.85560051	-19.49563008	0.241458964	-0.434929105
2012q1	-20.17262383	12.74283323	0.281367679	2.883317097
2012q2	14.40312799	6.87544572	2.830031135	2.786442041
2012q3	-17.39293437	-10.17856017	-1.601543034	3.000224602
2012q4	39.18013235	0.662550761	2.919591684	3.206226984
2013q1	-19.11366584	7.648929834	-0.649248658	-0.975282343
2013q2	13.01470037	-2.230440946	4.116631252	-2.103105164
2013q3	-12.73870556	14.33435723	0.075072046	4.013381727
2013q4	37.80112178	1.307539566	2.066380963	11.49386914
2014q1	-17.61398522	-16.50809307	-1.4980082	-1.588513864
2014q2	15.69489453	8.936361514	2.539750552	-0.910175616
2014q3	-21.02211864	10.06177885	0.265438725	-0.554682759
2014q4	40.19281702	4.615402863	2.965063879	-1.999428046
2015q1	-21.49931035	-9.65714482	-2.993331426	-1.870375149
2015q2	17.52964493	6.2083617	2.290455255	2.462458622
2015q3	-15.79294171	-0.638324566	0.426996207	-0.005163667
2015q4	27.29766342	-0.491015089	1.618787985	-2.556353662
2016q1	-20.72746741	-6.909268354	-2.173258145	-2.819450195
2016q2	11.57146073	18.49485995	2.218418185	1.312765402
2016q3	-18.0545695	-9.257675626	0.050899604	-1.908779643
2016q4	29.3519498	-0.251836844	3.669795187	-3.781768553

2017q1	-18.89069848	4.267777258	-3.299555022	-0.655938467
2017q2	12.37624193	-12.60958041	2.48298445	0.62979392
2017q3	-5.611806839	15.38677831	2.702213453	1.711728079
2017q4	24.30875387	-3.372077262	1.807451951	1.722317241
2018q1	-13.79511149	-9.594554776	-2.470265576	1.758704128
2018q2	2.544291213	7.27277657	1.906270047	0.916509926
2018q3	9.902528395	1.830468423	1.972641418	1.915965474
2018q4	20.31752566	8.882064431	2.005370247	-0.016305559

- Uji Stasioneritas

```
. dfuller gr_ta, lags(2)
Augmented Dickey-Fuller test for unit root      Number of obs   =      40

              Test Statistic      Interpolated Dickey-Fuller
              -----            -----
              1% Critical          5% Critical          10% Critical
              Value                Value                Value
-----
Z(t)          -9.928              -3.648              -2.958              -2.612
MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller gr_trade, lags(2)
Augmented Dickey-Fuller test for unit root      Number of obs   =      40

              Test Statistic      Interpolated Dickey-Fuller
              -----            -----
              1% Critical          5% Critical          10% Critical
              Value                Value                Value
-----
Z(t)          -5.165              -3.648              -2.958              -2.612
MacKinnon approximate p-value for Z(t) = 0.0000

. dfuller gr_gdp, lags(2)
Augmented Dickey-Fuller test for unit root      Number of obs   =      40

              Test Statistic      Interpolated Dickey-Fuller
              -----            -----
              1% Critical          5% Critical          10% Critical
              Value                Value                Value
-----
Z(t)          -4.170              -3.648              -2.958              -2.612
MacKinnon approximate p-value for Z(t) = 0.0007

. dfuller gr_er, lags(2)
Augmented Dickey-Fuller test for unit root      Number of obs   =      40

              Test Statistic      Interpolated Dickey-Fuller
              -----            -----
              1% Critical          5% Critical          10% Critical
              Value                Value                Value
-----
Z(t)          -3.744              -3.648              -2.958              -2.612
MacKinnon approximate p-value for Z(t) = 0.0035
```

- Uji Lag Optimum

```
varsoc gr_ta gr_trade gr_gdp gr_er
```

Selection-order criteria

Sample: 2009q2 - 2018q4

Number of obs = 39

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-515.362				4.3e+06	26.634	26.6952	26.8046
1	-473.747	83.231	16	0.000	1.2e+06	25.3204	25.6264	26.1735*
2	-451.387	44.72	16	0.000	870271	24.9942	25.5452	26.5298
3	-422.244	58.286	16	0.000	476688	24.3202	25.116	26.5383
4	-399.783	44.922*	16	0.000	395311*	23.9889*	25.0296*	26.8894

Endogenous: gr_ta gr_trade gr_gdp gr_er

Exogenous: _cons

- Estimasi VAR

```
. var gr_ta gr_trade gr_gdp gr_er, lags(4)
```

Vector autoregression

Sample: 2009q2 - 2018q4

Number of obs = 39

Log likelihood = -462.6022

AIC = 24.74883

FPE = 661984.1

HQIC = 25.05492

Det(Sigma_ml) = 236022

SBIC = 25.60194

Equation	Parms	RMSE	R-sq	chi2	P>chi2
gr_ta	5	6.57078	0.9115	401.7735	0.0000
gr_trade	5	15.0803	0.1361	6.146363	0.1885
gr_gdp	5	2.24624	0.2636	13.96108	0.0074
gr_er	5	3.12647	0.0661	2.762099	0.5984

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
gr_ta					
gr_ta					
L4.	.956614	.0565055	16.93	0.000	.8458653 1.067363
gr_trade					
L4.	-.0592122	.064425	-0.92	0.358	-.1854829 .0670585
gr_gdp					
L4.	-.2086291	.4371341	-0.48	0.633	-1.065396 .648138
gr_er					
L4.	.2336128	.310147	0.75	0.451	-.3742641 .8414898
_cons	.8559595	1.096573	0.78	0.435	-1.293284 3.005203
gr_trade					
gr_ta					
L4.	.0876065	.129683	0.68	0.499	-.1665675 .3417805
gr_trade					
L4.	-.1647554	.1478587	-1.11	0.265	-.4545532 .1250424
gr_gdp					
L4.	-.3187139	1.003245	-0.32	0.751	-2.285039 1.647611

gr_er							
L4.	1.223668	.7118034	1.72	0.086	-.1714414	2.618777	
_cons	2.545297	2.516692	1.01	0.312	-2.387329	7.477923	
<hr/>							
gr_gdp							
gr_ta							
L4.	.0611055	.0193165	3.16	0.002	.0232457	.0989652	
gr_trade							
L4.	-.0179591	.0220239	-0.82	0.415	-.061125	.0252069	
gr_gdp							
L4.	.0080009	.1494354	0.05	0.957	-.2848872	.300889	
gr_er							
L4.	-.1106355	.1060246	-1.04	0.297	-.3184398	.0971689	
_cons	1.30516	.3748664	3.48	0.000	.5704349	2.039884	
<hr/>							
gr_er							
gr_ta							
L4.	.0036843	.0268861	0.14	0.891	-.0490115	.05638	
gr_trade							
L4.	.0195999	.0306543	0.64	0.523	-.0404815	.0796812	
gr_gdp							
L4.	.24705	.2079945	1.19	0.235	-.1606117	.6547116	
gr_er							
L4.	.0182023	.1475722	0.12	0.902	-.2710339	.3074386	
_cons	-.17718	.5217647	-0.34	0.734	-1.19982	.84546	

- Uji Kausalitas Granger

```
vargranger
```

```
Granger causality Wald tests
```

Equation	Excluded	chi2	df	Prob > chi2
gr_ta	gr_trade	.84472	1	0.358
gr_ta	gr_gdp	.22778	1	0.633
gr_ta	gr_er	.56736	1	0.451
gr_ta	ALL	2.1399	3	0.544
gr_trade	gr_ta	.45636	1	0.499
gr_trade	gr_gdp	.10092	1	0.751
gr_trade	gr_er	2.9553	1	0.086
gr_trade	ALL	5.2528	3	0.154
gr_gdp	gr_ta	10.007	1	0.002
gr_gdp	gr_trade	.66494	1	0.415

gr_gdp	gr_er	1.0889	1	0.297
gr_gdp	ALL	10.149	3	0.017
gr_er	gr_ta	.01878	1	0.891
gr_er	gr_trade	.40881	1	0.523
gr_er	gr_gdp	1.4108	1	0.235
gr_er	ALL	2.7114	3	0.438

- Uji Autokorelasi

```
. varlmar, mlag(5)
```

Lagrange-multiplier test

lag	chi2	df	Prob > chi2
1	19.0598	16	0.26558
2	13.6594	16	0.62407
3	15.0217	16	0.52305
4	29.9284	16	0.01838
5	12.8653	16	0.68258

H0: no autocorrelation at lag order

- Uji Heteroskedastisitas

```
varhet
```

White VAR residual heteroskedasticity test
(No cross terms: Only levels and squares)

```
chi2          = 321.454
df            = 320
Prob > chi2   = 0.467
```

- Uji Multikolinearitas

```
. correlate gr_ta gr_trade gr_gdp gr_er
(obs=43)
```

	gr_ta	gr_trade	gr_gdp	gr_er
gr_ta	1.0000			
gr_trade	0.1780	1.0000		
gr_gdp	0.4374	0.0768	1.0000	
gr_er	0.1806	0.0305	-0.2919	1.0000