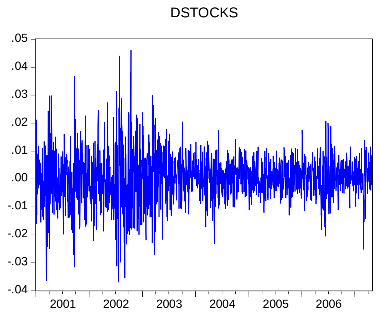
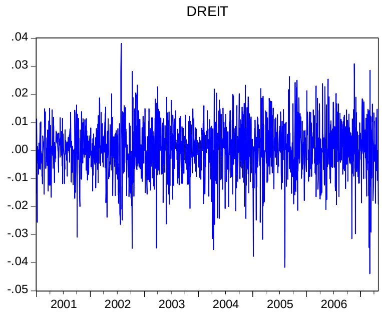
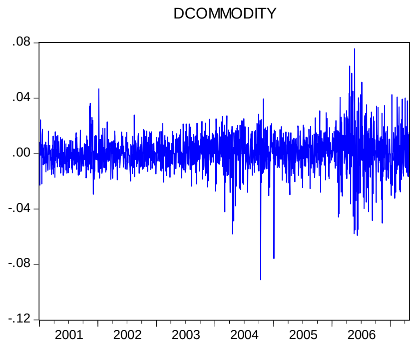
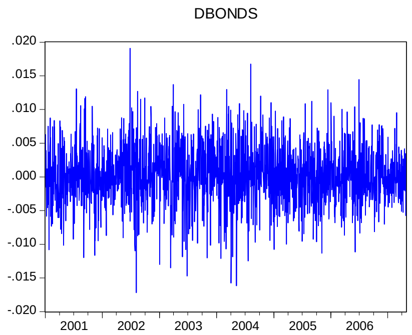
Brief Sketch of Solutions: Tutorial 3

3) unit root tests









Null Hypothesis: DSTOCKS has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on SIC, MAXLAG=24)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-35.47405	0.0000
Test critical values:	1% level	-2.566364	
	5% level	-1.941016	
	10% level	-1.616570	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DSTOCKS)
Method: Least Squares
Date: 07/12/11 Time: 09:49
Sample (adjusted): 1/02/2001 4/30/2007
Included observations: 1650 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DSTOCKS(-1)	-0.865721	0.024404	-35.47405	0.0000
R-squared	0.432828	Mean dependent var		-2.39E-06

Adjusted R-squared	0.432828	S.D. dependent var	0.011251
S.E. of regression	0.008473	Akaike info criterion	-6.703250
Sum squared resid	0.118386	Schwarz criterion	-6.699972
Log likelihood	5531.181	Hannan-Quinn criter.	-6.702035
Durbin-Watson stat	1.990981		

Null Hypothesis: DREIT has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on SIC, MAXLAG=24)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-36.77732	0.0000
Test critical values:	1% level	-2.566364	
	5% level	-1.941016	
	10% level	-1.616570	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DREIT)
Method: Least Squares
Date: 07/12/11 Time: 09:50
Sample (adjusted): 1/02/2001 4/30/2007
Included observations: 1650 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DREIT(-1)	-0.902461	0.024539	-36.77732	0.0000

R-squared	0.450621	Mean dependent var	-1.16E-05
Adjusted R-squared	0.450621	S.D. dependent var	0.012853
S.E. of regression	0.009526	Akaike info criterion	-6.468896
Sum squared resid	0.149650	Schwarz criterion	-6.465618
Log likelihood	5337.839	Hannan-Quinn criter.	-6.467681
Durbin-Watson stat	1.998993		

Null Hypothesis: DCOMMODITY has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on SIC, MAXLAG=24)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-43.00418	0.0001
Test critical values:	1% level	-2.566364	
	5% level	-1.941016	
	10% level	-1.616570	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DCOMMODITY)
Method: Least Squares

Date: 07/12/11 Time: 09:51
Sample (adjusted): 1/02/2001 4/30/2007
Included observations: 1650 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DCOMMODITY(-1)	-1.057277	0.024585	-43.00418	0.0000

R-squared	0.528636	Mean dependent var	1.03E-06
Adjusted R-squared	0.528636	S.D. dependent var	0.019343
S.E. of regression	0.013280	Akaike info criterion	-5.804442
Sum squared resid	0.290835	Schwarz criterion	-5.801164
Log likelihood	4789.664	Hannan-Quinn criter.	-5.803226
Durbin-Watson stat	2.005668		

Null Hypothesis: DBONDS has a unit root
Exogenous: None
Lag Length: 0 (Automatic based on SIC, MAXLAG=24)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-40.10573	0.0000
Test critical values:	1% level	-2.566364	
	5% level	-1.941016	
	10% level	-1.616570	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DBONDS)
Method: Least Squares
Date: 07/12/11 Time: 09:52
Sample (adjusted): 1/02/2001 4/30/2007
Included observations: 1650 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DBONDS(-1)	-0.987673	0.024627	-40.10573	0.0000

R-squared	0.493779	Mean dependent var	1.66E-06
Adjusted R-squared	0.493779	S.D. dependent var	0.006229
S.E. of regression	0.004432	Akaike info criterion	-7.999494
Sum squared resid	0.032385	Schwarz criterion	-7.996216
Log likelihood	6600.582	Hannan-Quinn criter.	-7.998278
Durbin-Watson stat	1.998625		

4)

VAR Lag Order Selection Criteria
Endogenous variables: DREIT DSTOCKS DCOMMODITY DBONDS
Exogenous variables: C
Date: 07/12/11 Time: 09:53
Sample: 12/29/2000 4/30/2007
Included observations: 1643

Lag	LogL	LR	FPE	AIC	SC	HQ
0	22398.32	NA	1.70e-17	-27.26027	-27.24712*	-27.25540
1	22437.26	77.65093	1.66e-17	-27.28820	-27.22242	-27.26381*
2	22454.19	33.66741*	1.65e-17*	-27.28933*	-27.17092	-27.24542
3	22462.42	16.33802	1.67e-17	-27.27988	-27.10884	-27.21645
4	22469.22	13.45168	1.69e-17	-27.26868	-27.04500	-27.18573
5	22480.90	23.07763	1.70e-17	-27.26343	-26.98713	-27.16096
6	22493.58	24.96343	1.70e-17	-27.25938	-26.93045	-27.13740
7	22499.20	11.03736	1.73e-17	-27.24674	-26.86518	-27.10524
8	22510.46	22.08032	1.74e-17	-27.24098	-26.80679	-27.07997

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Vector Autoregression Estimates
Date: 07/12/11 Time: 09:53
Sample (adjusted): 1/05/2001 4/30/2007
Included observations: 1647 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	DREIT	DSTOCKS	DCOMMODITY	DBONDS
DREIT(-1)	0.106712	0.094934	0.088927	0.027253
	(0.02769)	(0.02444)	(0.03832)	(0.01288)
	[3.85409]	[3.88428]	[2.32069]	[2.11621]
DREIT(-2)	-0.007667	-0.056115	-0.063751	0.003648
	(0.02789)	(0.02462)	(0.03859)	(0.01297)
	[-0.27494]	[-2.27959]	[-1.65181]	[0.28123]
DREIT(-3)	-0.019792	0.003763	-0.011650	0.016350
	(0.02788)	(0.02461)	(0.03858)	(0.01297)
	[-0.70994]	[0.15291]	[-0.30194]	[1.26090]
DREIT(-4)	-0.007343	-0.050482	-0.038826	0.007570
	(0.02777)	(0.02451)	(0.03843)	(0.01292)
	[-0.26443]	[-2.05947]	[-1.01027]	[0.58613]
DSTOCKS(-1)	-0.016884	0.103733	0.077104	-0.015290
	(0.03207)	(0.02831)	(0.04439)	(0.01492)
	[-0.52641]	[3.66383]	[1.73698]	[-1.02486]
DSTOCKS(-2)	0.058375	0.003709	0.093039	0.016724

	(0.03214)	(0.02837)	(0.04448)	(0.01495)
	[1.81637]	[0.13073]	[2.09179]	[1.11877]
DSTOCKS(-3)	-0.023533	-0.022935	0.008682	-0.025232
	(0.03208)	(0.02831)	(0.04439)	(0.01492)
	[-0.73364]	[-0.81002]	[0.19557]	[-1.69122]
DSTOCKS(-4)	-0.004469	0.040459	0.093005	-0.003947
	(0.03181)	(0.02808)	(0.04403)	(0.01480)
	[-0.14050]	[1.44085]	[2.11254]	[-0.26673]
DCOMMODITY(-1)	-0.001101	-0.010920	-0.086016	0.011037
	(0.01851)	(0.01634)	(0.02562)	(0.00861)
	[-0.05948]	[-0.66819]	[-3.35698]	[1.28168]
DCOMMODITY(-2)	-0.013010	-0.006358	-0.076151	-0.009329
	(0.01855)	(0.01637)	(0.02567)	(0.00863)
	[-0.70148]	[-0.38835]	[-2.96679]	[-1.08147]
DCOMMODITY(-3)	0.021953	0.014419	0.026825	0.009172
	(0.01854)	(0.01636)	(0.02565)	(0.00862)
	[1.18428]	[0.88119]	[1.04564]	[1.06378]
DCOMMODITY(-4)	0.012471	-0.015094	-0.028115	0.001124
	(0.01848)	(0.01631)	(0.02558)	(0.00860)
	[0.67477]	[-0.92521]	[-1.09916]	[0.13080]
DBONDS(-1)	0.113816	-0.002695	0.074525	0.007547
	(0.05366)	(0.04737)	(0.07426)	(0.02496)
	[2.12103]	[-0.05691]	[1.00351]	[0.30237]
DBONDS(-2)	-0.075219	-0.128049	0.013581	-0.001020
	(0.05369)	(0.04739)	(0.07430)	(0.02497)
	[-1.40103]	[-2.70192]	[0.18278]	[-0.04084]
DBONDS(-3)	-0.059749	0.057224	-0.085815	-0.032474
	(0.05378)	(0.04748)	(0.07444)	(0.02502)
	[-1.11090]	[1.20531]	[-1.15287]	[-1.29812]
DBONDS(-4)	-0.026924	-0.011782	0.083718	0.021623
	(0.05379)	(0.04748)	(0.07444)	(0.02502)
	[-0.50055]	[-0.24815]	[1.12463]	[0.86431]
C	0.000360	0.000171	0.000782	0.000222
	(0.00024)	(0.00021)	(0.00033)	(0.00011)
	[1.51545]	[0.81376]	[2.37639]	[2.00486]
R-squared	0.018351	0.039523	0.024825	0.009127
Adj. R-squared	0.008715	0.030095	0.015252	-0.000599
Sum sq. resids	0.147698	0.115084	0.282896	0.031953
S.E. equation	0.009519	0.008403	0.013174	0.004428
F-statistic	1.904487	4.192060	2.593399	0.938381
Log likelihood	5337.450	5542.915	4802.249	6598.139
Akaike AIC	-6.460777	-6.710280	-5.810868	-7.991668
Schwarz SC	-6.404970	-6.654473	-5.755061	-7.935861
Mean dependent	0.000394	0.000153	0.000719	0.000247
S.D. dependent	0.009561	0.008532	0.013276	0.004426

Determinant resid covariance (dof adj.)	1.62E-17
Determinant resid covariance	1.56E-17
Log likelihood	22523.39
Akaike information criterion	-27.26824
Schwarz criterion	-27.04501

5) Block Exogeneity Test

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 07/12/11 Time: 09:54
Sample: 12/29/2000 4/30/2007
Included observations: 1647

Dependent variable: DREIT

Excluded	Chi-sq	df	Prob.
DSTOCKS	3.791918	4	0.4349
DCOMMODITY	2.459770	4	0.6519
DBONDS	8.030294	4	0.0905
All	13.46622	12	0.3361

Dependent variable: DSTOCKS

Excluded	Chi-sq	df	Prob.
DREIT	23.99538	4	0.0001
DCOMMODITY	2.470684	4	0.6499
DBONDS	8.781109	4	0.0668
All	33.36721	12	0.0008

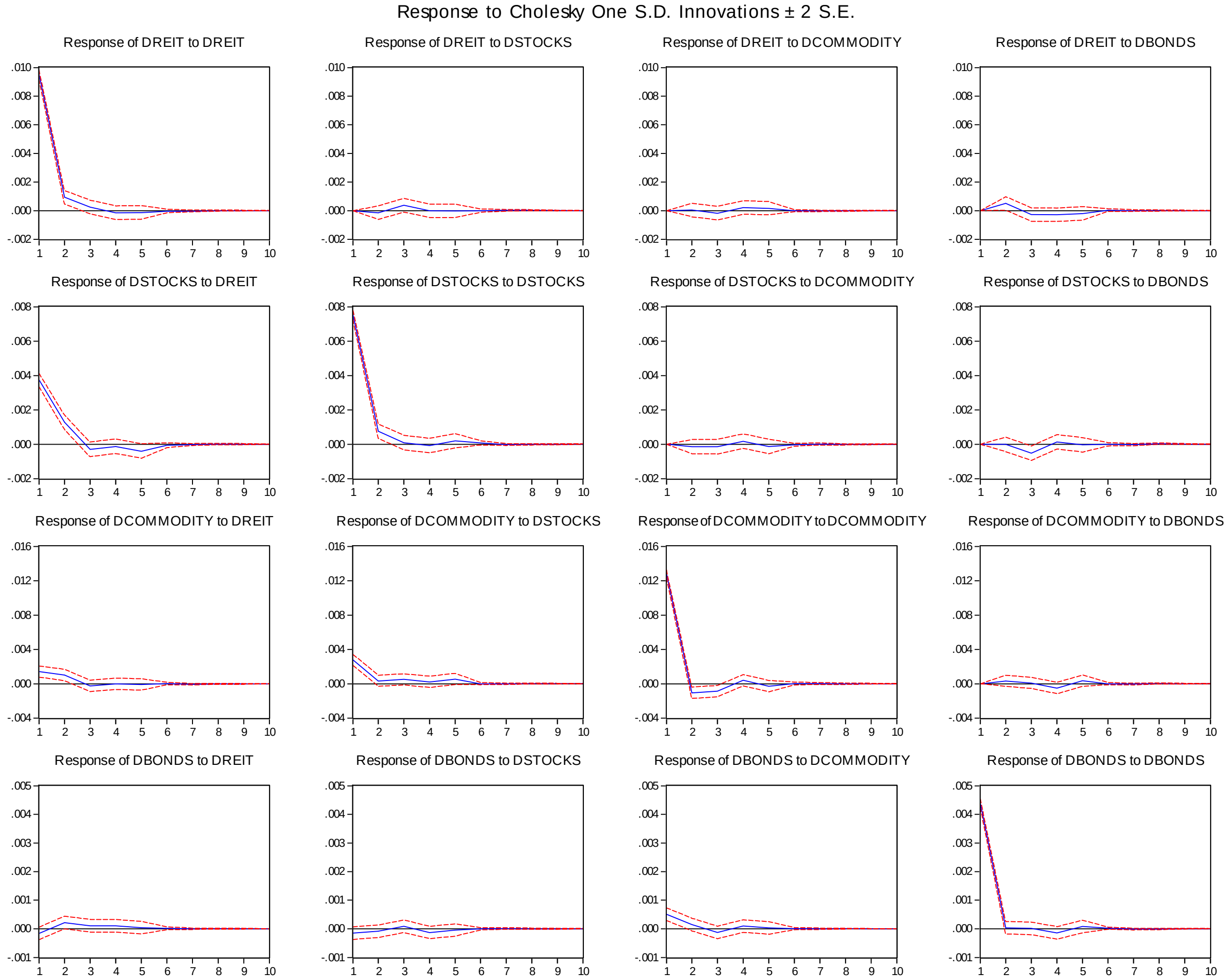
Dependent variable: DCOMMODITY

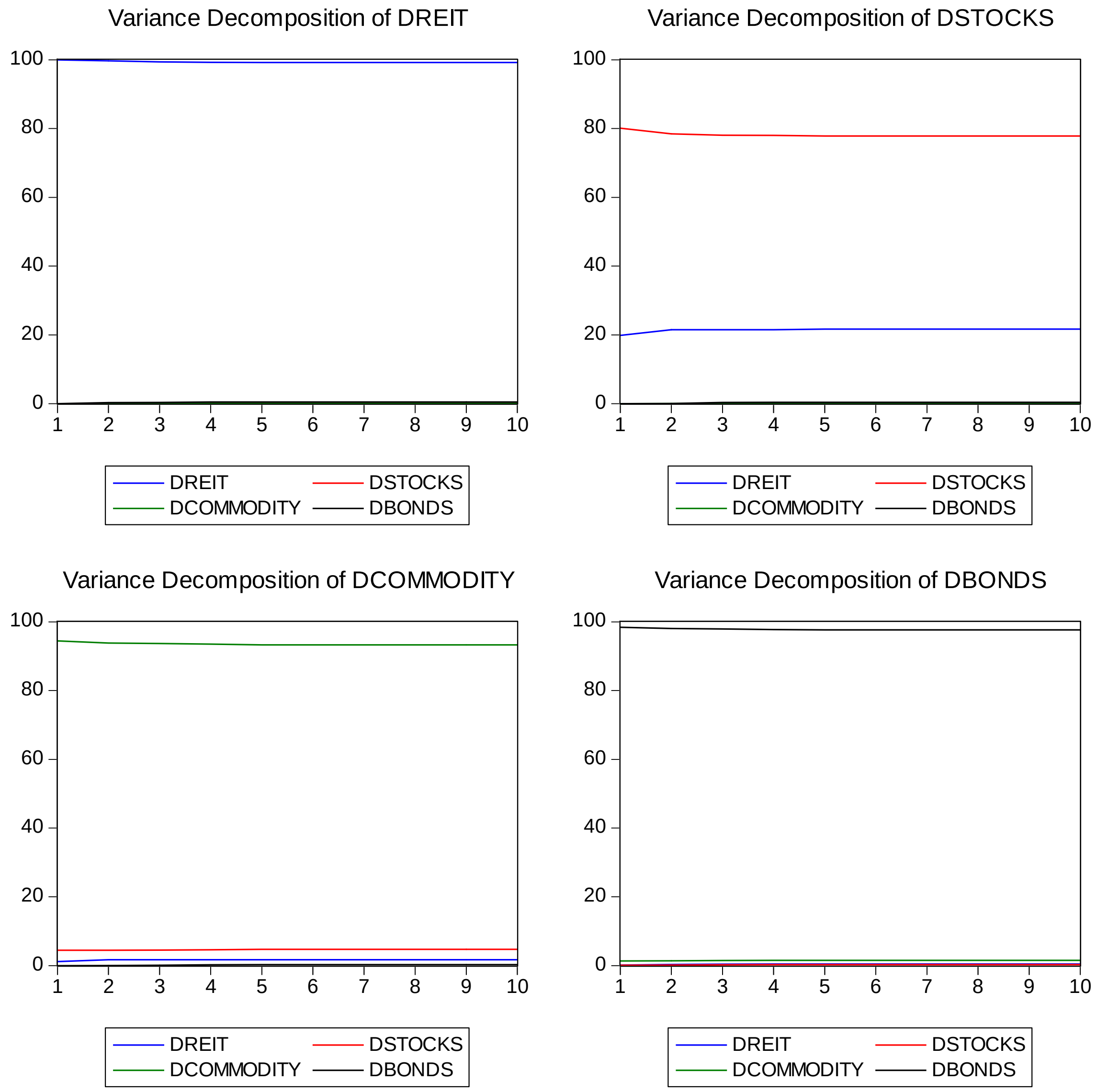
Excluded	Chi-sq	df	Prob.
DREIT	9.025828	4	0.0605
DSTOCKS	12.49715	4	0.0140
DBONDS	3.572250	4	0.4670
All	27.47819	12	0.0066

Dependent variable: DBONDS

Excluded	Chi-sq	df	Prob.
DREIT	6.806941	4	0.1464
DSTOCKS	4.763142	4	0.3125
DCOMMODITY	4.275083	4	0.3701
All	12.98709	12	0.3700

6) Impulse Response functions





8)

Same procedure again

VAR Lag Order Selection Criteria
Endogenous variables: DREIT DSTOCKS DCOMMODITY DBONDS
Exogenous variables: C
Date: 07/12/11 Time: 10:00
Sample: 5/01/2007 11/30/2009
Included observations: 666

Lag	LogL	LR	FPE	AIC	SC	HQ

0	7490.807	NA	2.02e-15	-22.48291	-22.45587	-22.47243
1	7593.831	204.5008	1.56e-15	-22.74424	-22.60906*	-22.69187*
2	7616.416	44.55853	1.53e-15*	-22.76401*	-22.52070	-22.66974
3	7626.985	20.72510	1.55e-15	-22.74770	-22.39625	-22.61153
4	7644.135	33.42553*	1.55e-15	-22.75116	-22.29157	-22.57309
5	7648.294	8.056134	1.60e-15	-22.71560	-22.14787	-22.49563
6	7655.927	14.69325	1.64e-15	-22.69047	-22.01460	-22.42861
7	7667.172	21.50911	1.67e-15	-22.67619	-21.89218	-22.37243
8	7680.036	24.45362	1.68e-15	-22.66677	-21.77463	-22.32112

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Vector Autoregression Estimates
Date: 07/12/11 Time: 10:00
Sample (adjusted): 5/04/2007 11/30/2009
Included observations: 672 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	DREIT	DSTOCKS	DCOMMODITY	DBONDS
DREIT(-1)	-0.178238	0.081575	0.077251	0.005377
	(0.05502)	(0.02377)	(0.03080)	(0.00778)
	[-3.23951]	[3.43163]	[2.50789]	[0.69103]
DREIT(-2)	0.081619	0.070325	0.034296	-0.019905
	(0.05163)	(0.02231)	(0.02891)	(0.00730)
	[1.58085]	[3.15263]	[1.18651]	[-2.72620]
DSTOCKS(-1)	-0.269220	-0.009951	0.030112	0.020133
	(0.14275)	(0.06167)	(0.07992)	(0.02019)
	[-1.88601]	[-0.16135]	[0.37679]	[0.99738]
DSTOCKS(-2)	-0.414059	-0.226954	-0.187831	0.044599
	(0.13166)	(0.05688)	(0.07371)	(0.01862)
	[-3.14495]	[-3.98982]	[-2.54826]	[2.39539]
DCOMMODITY(-1)	-0.027241	-0.029559	-0.121940	2.81E-05
	(0.08159)	(0.03525)	(0.04568)	(0.01154)
	[-0.33389]	[-0.83856]	[-2.66962]	[0.00244]
DCOMMODITY(-2)	0.165129	0.086486	0.085200	-0.012213
	(0.08120)	(0.03508)	(0.04546)	(0.01148)
	[2.03363]	[2.46524]	[1.87419]	[-1.06357]
DBONDS(-1)	-0.293161	0.002223	-0.167431	0.073572
	(0.27574)	(0.11913)	(0.15438)	(0.03899)
	[-1.06318]	[0.01866]	[-1.08457]	[1.88675]
DBONDS(-2)	0.771655	0.089212	0.040718	-0.100054
	(0.27645)	(0.11944)	(0.15477)	(0.03909)
	[2.79132]	[0.74692]	[0.26309]	[-2.55930]
C	-0.001301	-0.000477	-0.000499	0.000428

	(0.00142)	(0.00062)	(0.00080)	(0.00020)
	[-0.91365]	[-0.77552]	[-0.62630]	[2.12330]
R-squared	0.093228	0.060054	0.049163	0.030563
Adj. R-squared	0.082286	0.048713	0.037690	0.018865
Sum sq. resids	0.892747	0.166648	0.279821	0.017853
S.E. equation	0.036695	0.015854	0.020544	0.005189
F-statistic	8.520607	5.295003	4.285064	2.612761
Log likelihood	1272.040	1835.989	1661.852	2586.508
Akaike AIC	-3.759047	-5.437467	-4.919202	-7.671154
Schwarz SC	-3.698642	-5.377061	-4.858796	-7.610749
Mean dependent	-0.000780	-0.000483	-0.000546	0.000405
S.D. dependent	0.038305	0.016255	0.020942	0.005239

Determinant resid covariance (dof adj.)	1.41E-15
Determinant resid covariance	1.34E-15
Log likelihood	7693.796
Akaike information criterion	-22.79106
Schwarz criterion	-22.54944

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 07/12/11 Time: 10:00
Sample: 5/01/2007 11/30/2009
Included observations: 672

Dependent variable: DREIT

Excluded	Chi-sq	df	Prob.
DSTOCKS	14.59070	2	0.0007
DCOMMODITY	4.430445	2	0.1091
DBONDS	8.591093	2	0.0136
All	25.34364	6	0.0003

Dependent variable: DSTOCKS

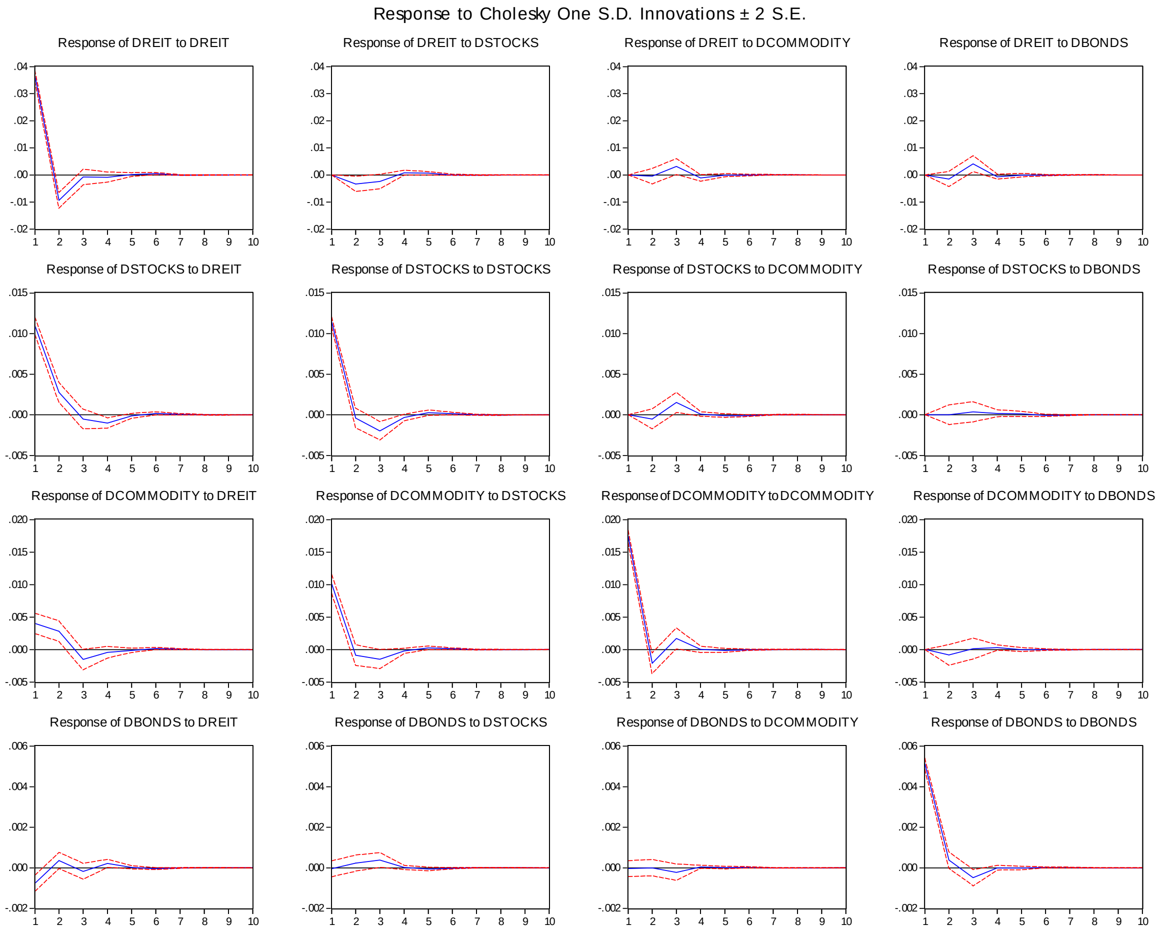
Excluded	Chi-sq	df	Prob.
DREIT	16.99964	2	0.0002
DCOMMODITY	7.274746	2	0.0263
DBONDS	0.562042	2	0.7550
All	24.25489	6	0.0005

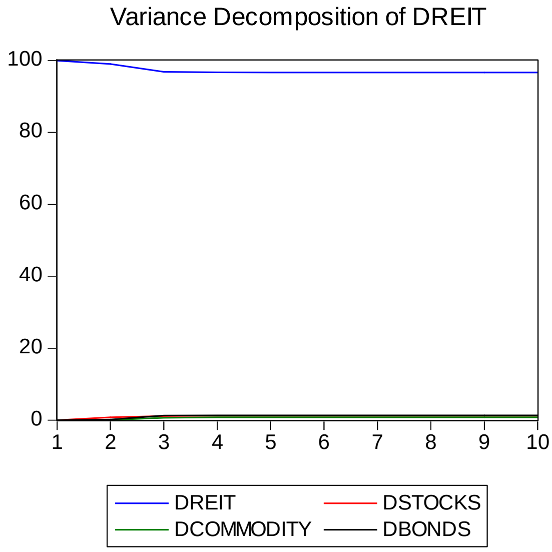
Dependent variable: DCOMMODITY

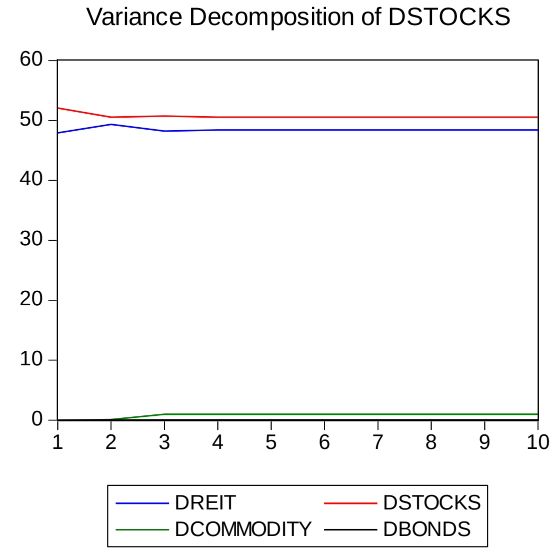
Excluded	Chi-sq	df	Prob.
DREIT	6.546074	2	0.0379
DSTOCKS	6.517825	2	0.0384
DBONDS	1.215170	2	0.5447
All	28.52344	6	0.0001

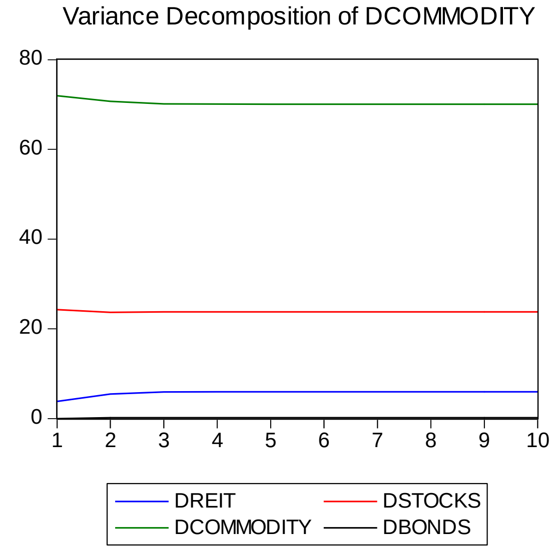
Dependent variable: DBONDS

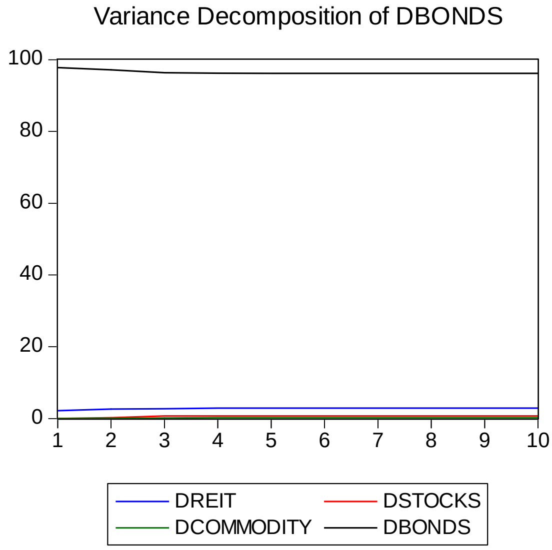
Excluded	Chi-sq	df	Prob.
DREIT	9.718957	2	0.0078
DSTOCKS	7.203057	2	0.0273
DCOMMODITY	1.143466	2	0.5645
All	13.82312	6	0.0317











9) similar results including hedge fund index

VAR Lag Order Selection Criteria
Endogenous variables: DREIT DHEDGE DSTOCKS DCOMMODITY DBONDS
Exogenous variables: C
Date: 07/12/11 Time: 10:03
Sample: 5/01/2007 11/30/2009
Included observations: 666

Lag	LogL	LR	FPE	AIC	SC	HQ
0	10631.15	NA	9.53e-21	-31.91037	-31.87657	-31.89727
1	10760.05	255.4739	6.98e-21	-32.22237	-32.01961*	-32.14382*
2	10797.80	74.24968	6.71e-21	-32.26066	-31.88893	-32.11663
3	10827.16	57.30932	6.63e-21	-32.27375	-31.73305	-32.06426
4	10852.31	48.70860*	6.62e-21*	-32.27419*	-31.56453	-31.99924
5	10863.76	22.00810	6.90e-21	-32.23350	-31.35487	-31.89308
6	10877.66	26.50273	7.14e-21	-32.20017	-31.15257	-31.79428
7	10892.13	27.38136	7.37e-21	-32.16855	-30.95199	-31.69720

8	10909.76	33.10041	7.53e-21	-32.14644	-30.76091	-31.60962

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Vector Autoregression Estimates
Date: 07/12/11 Time: 10:03
Sample (adjusted): 5/08/2007 11/30/2009
Included observations: 670 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	DREIT	DHEDGE	DSTOCKS	DCOMMODITY	DBONDS
DREIT(-1)	-0.192167	0.018958	0.095632	0.101814	0.002859
	(0.05807)	(0.00400)	(0.02512)	(0.03238)	(0.00825)
	[-3.30914]	[4.74425]	[3.80641]	[3.14418]	[0.34648]
DREIT(-2)	0.085922	0.014941	0.093938	0.067424	-0.022974
	(0.06123)	(0.00421)	(0.02649)	(0.03414)	(0.00870)
	[1.40323]	[3.54589]	[3.54599]	[1.97471]	[-2.64069]
DREIT(-3)	-0.066071	0.009045	-0.000557	0.046550	-0.010239
	(0.06157)	(0.00424)	(0.02664)	(0.03433)	(0.00875)
	[-1.07307]	[2.13487]	[-0.02090]	[1.35582]	[-1.17036]
DREIT(-4)	0.045940	-0.002280	-0.001145	0.028454	-0.017367
	(0.05548)	(0.00382)	(0.02400)	(0.03094)	(0.00788)
	[0.82806]	[-0.59716]	[-0.04771]	[0.91977]	[-2.20318]
DHEDGE(-1)	-0.013940	0.196454	0.488863	0.782045	-0.033395
	(0.70420)	(0.04846)	(0.30467)	(0.39268)	(0.10006)
	[-0.01979]	[4.05408]	[1.60458]	[1.99156]	[-0.33377]
DHEDGE(-2)	0.386117	0.073205	0.005655	0.254878	-0.083433
	(0.70094)	(0.04823)	(0.30326)	(0.39086)	(0.09959)
	[0.55085]	[1.51771]	[0.01865]	[0.65209]	[-0.83775]
DHEDGE(-3)	0.792102	0.143973	-0.028398	-0.392054	0.149626
	(0.69489)	(0.04782)	(0.30064)	(0.38749)	(0.09873)
	[1.13989]	[3.01087]	[-0.09446]	[-1.01179]	[1.51547]
DHEDGE(-4)	-0.040431	0.127006	0.095985	0.732388	0.013272
	(0.69989)	(0.04816)	(0.30280)	(0.39027)	(0.09944)
	[-0.05777]	[2.63710]	[0.31699]	[1.87661]	[0.13346]
DSTOCKS(-1)	-0.194983	-0.015125	-0.059574	-0.075370	0.028574
	(0.16331)	(0.01124)	(0.07065)	(0.09106)	(0.02320)
	[-1.19395]	[-1.34593]	[-0.84318]	[-0.82765]	[1.23146]
DSTOCKS(-2)	-0.506114	-0.026817	-0.281389	-0.271232	0.058759
	(0.16271)	(0.01120)	(0.07039)	(0.09073)	(0.02312)
	[-3.11061]	[-2.39514]	[-3.99739]	[-2.98950]	[2.54174]

DSTOCKS(-3)	0.206881	-0.002424	0.143471	0.057060	0.019556
	(0.16416)	(0.01130)	(0.07102)	(0.09154)	(0.02332)
	[1.26022]	[-0.21462]	[2.02006]	[0.62333]	[0.83845]
DSTOCKS(-4)	-0.435195	0.002197	-0.025266	-0.034928	0.027275
	(0.15378)	(0.01058)	(0.06653)	(0.08575)	(0.02185)
	[-2.82995]	[0.20758]	[-0.37975]	[-0.40731]	[1.24830]
DCOMMODITY(-1)	-0.028593	-0.001737	-0.030204	-0.128587	0.000113
	(0.08305)	(0.00571)	(0.03593)	(0.04631)	(0.01180)
	[-0.34430]	[-0.30403]	[-0.84064]	[-2.77670]	[0.00954]
DCOMMODITY(-2)	0.149135	0.012545	0.086026	0.070526	-0.011453
	(0.08321)	(0.00573)	(0.03600)	(0.04640)	(0.01182)
	[1.79233]	[2.19095]	[2.38969]	[1.52001]	[-0.96879]
DCOMMODITY(-3)	-0.069677	-0.006543	-0.053070	-0.084019	-0.009947
	(0.08340)	(0.00574)	(0.03608)	(0.04650)	(0.01185)
	[-0.83548]	[-1.14022]	[-1.47087]	[-1.80672]	[-0.83947]
DCOMMODITY(-4)	0.220531	0.003649	0.058811	0.026642	-0.021504
	(0.08266)	(0.00569)	(0.03576)	(0.04609)	(0.01174)
	[2.66801]	[0.64155]	[1.64457]	[0.57804]	[-1.83104]
DBONDS(-1)	-0.255869	-0.003267	0.014164	-0.148722	0.065543
	(0.28032)	(0.01929)	(0.12128)	(0.15631)	(0.03983)
	[-0.91278]	[-0.16939]	[0.11679]	[-0.95144]	[1.64564]
DBONDS(-2)	0.812372	-0.025933	0.082639	0.063956	-0.113700
	(0.28001)	(0.01927)	(0.12114)	(0.15614)	(0.03978)
	[2.90126]	[-1.34592]	[0.68216]	[0.40961]	[-2.85794]
DBONDS(-3)	0.393603	0.007437	0.064343	-0.026348	0.021867
	(0.28142)	(0.01937)	(0.12176)	(0.15693)	(0.03999)
	[1.39861]	[0.38405]	[0.52846]	[-0.16790]	[0.54687]
DBONDS(-4)	0.106873	-0.015117	-0.029050	0.059197	-0.026043
	(0.28140)	(0.01936)	(0.12175)	(0.15691)	(0.03998)
	[0.37979]	[-0.78068]	[-0.23862]	[0.37726]	[-0.65136]
C	-0.001349	-7.69E-05	-0.000351	-0.000280	0.000433
	(0.00144)	(9.9E-05)	(0.00062)	(0.00080)	(0.00020)
	[-0.93824]	[-0.77730]	[-0.56395]	[-0.34949]	[2.11717]
R-squared	0.119102	0.182955	0.084182	0.082215	0.049077
Adj. R-squared	0.091956	0.157776	0.055959	0.053932	0.019773
Sum sq. resids	0.867188	0.004106	0.162318	0.269644	0.017506
S.E. equation	0.036554	0.002515	0.015815	0.020383	0.005194
F-statistic	4.387407	7.266285	2.982794	2.906852	1.674737
Log likelihood	1276.987	3070.150	1838.345	1668.318	2584.390
Akaike AIC	-3.749214	-9.101941	-5.424912	-4.917366	-7.651910
Schwarz SC	-3.607941	-8.960668	-5.283639	-4.776093	-7.510637
Mean dependent	-0.000775	-0.000228	-0.000499	-0.000580	0.000399
S.D. dependent	0.038360	0.002741	0.016277	0.020956	0.005246

Determinant resid covariance (dof adj.)	5.57E-21
Determinant resid covariance	4.75E-21
Log likelihood	10923.55
Akaike information criterion	-32.29417
Schwarz criterion	-31.58781

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 07/12/11 Time: 10:04
Sample: 5/01/2007 11/30/2009
Included observations: 670

Dependent variable: DREIT

Excluded	Chi-sq	df	Prob.
DHEDGE	1.998365	4	0.7361
DSTOCKS	20.63477	4	0.0004
DCOMMODITY	12.61835	4	0.0133
DBONDS	11.91042	4	0.0180
All	41.83224	16	0.0004

Dependent variable: DHEDGE

Excluded	Chi-sq	df	Prob.
DREIT	30.93580	4	0.0000
DSTOCKS	7.938113	4	0.0939
DCOMMODITY	7.707182	4	0.1029
DBONDS	2.395770	4	0.6634
All	54.08148	16	0.0000

Dependent variable: DSTOCKS

Excluded	Chi-sq	df	Prob.
DREIT	22.19022	4	0.0002
DHEDGE	3.209412	4	0.5234
DCOMMODITY	13.64437	4	0.0085
DBONDS	0.886772	4	0.9265
All	38.56129	16	0.0013

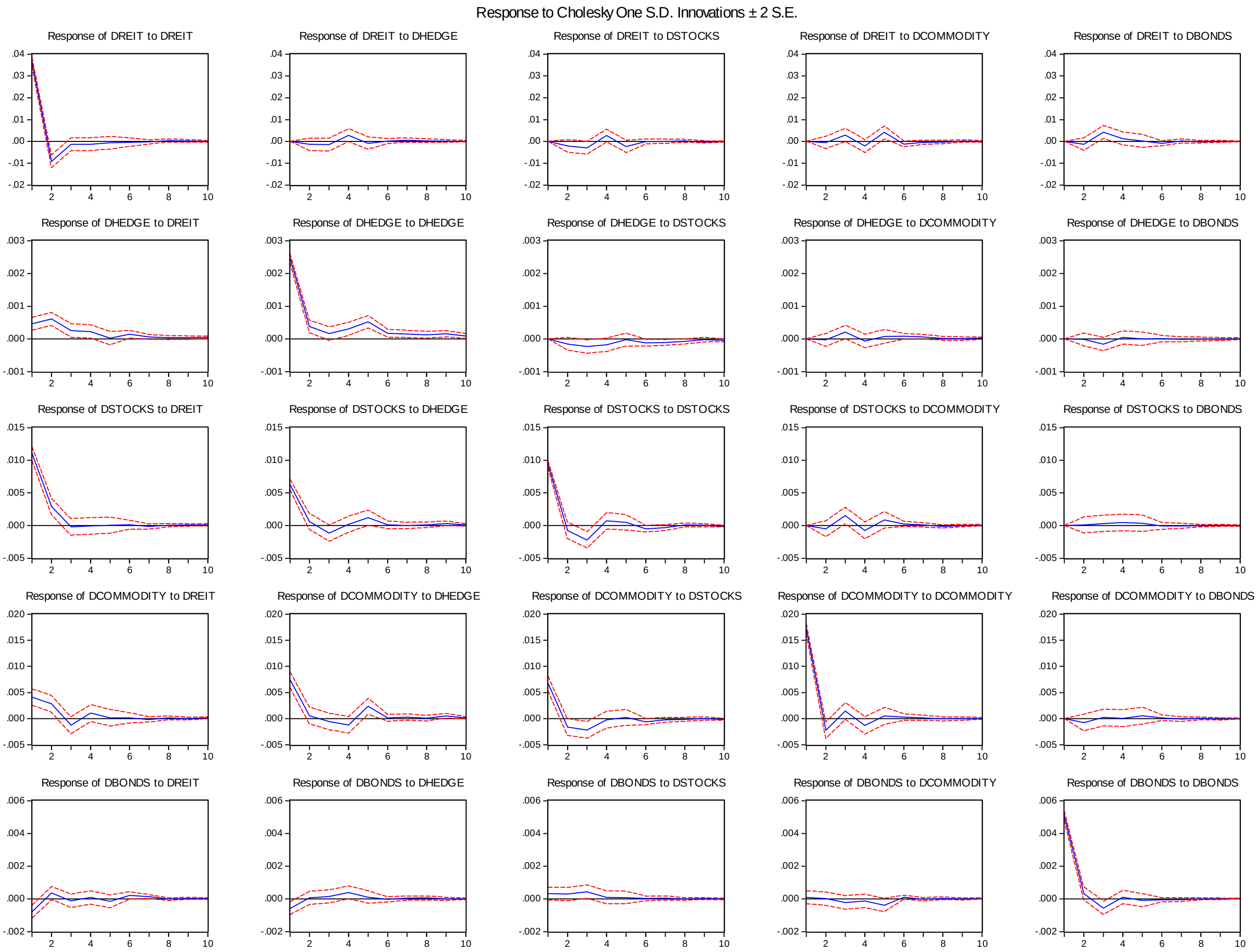
Dependent variable: DCOMMODITY

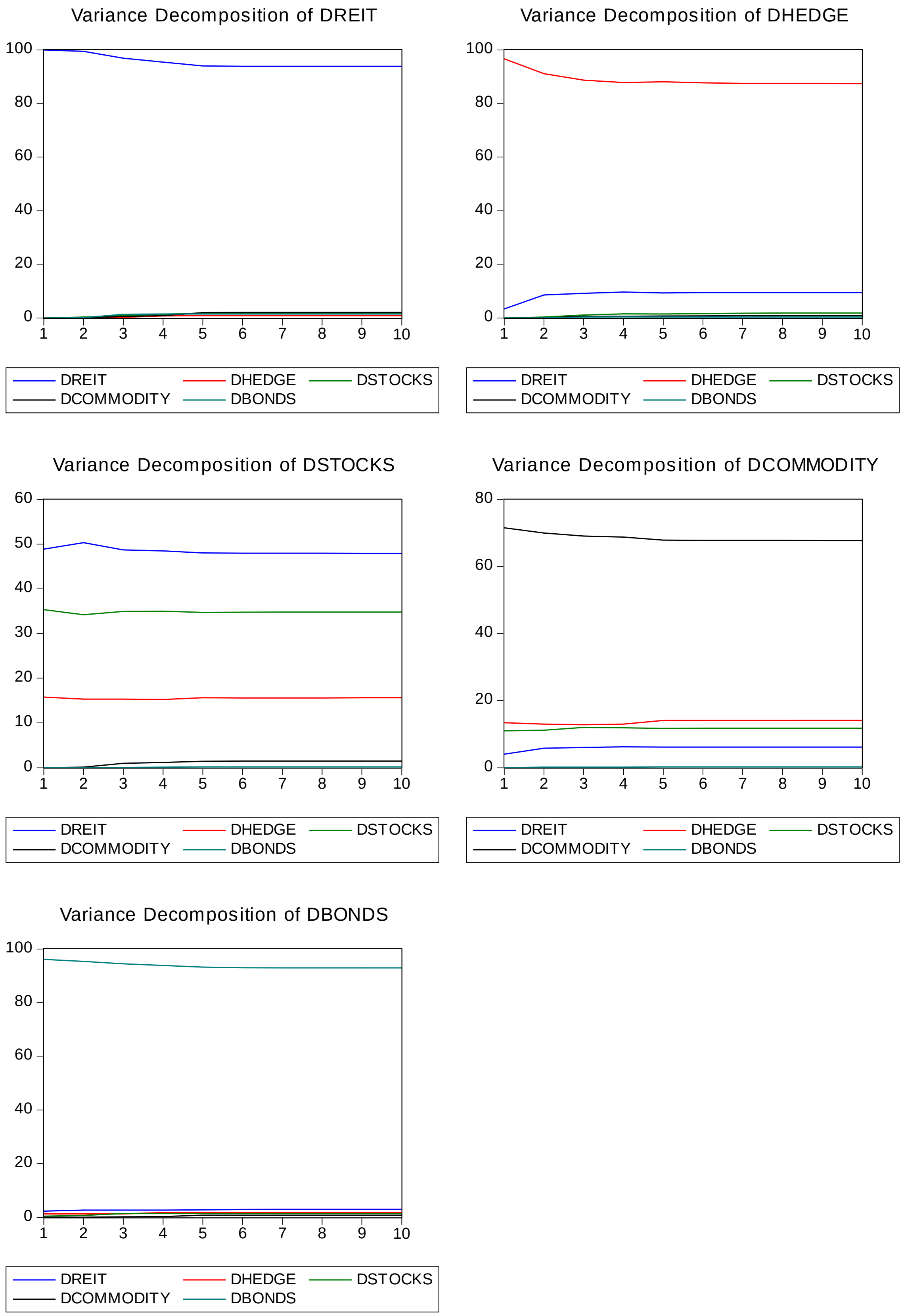
Excluded	Chi-sq	df	Prob.
DREIT	12.60661	4	0.0134
DHEDGE	11.10675	4	0.0254
DSTOCKS	10.29080	4	0.0358
DBONDS	1.133342	4	0.8889
All	47.02012	16	0.0001

Dependent variable: DBONDS

Excluded	Chi-sq	df	Prob.
DREIT	12.61099	4	0.0133
DHEDGE	2.807438	4	0.5905

DSTOCKS	10.83812	4	0.0284
DCOMMODITY	4.701524	4	0.3193
All	26.03383	16	0.0536





Variance Decomposition of DREIT
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10
DREIT DHEDGE DSTOCKS
DCOMMODITY DBONDS
Variance Decomposition of DHEDGE
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10
DREIT DHEDGE DSTOCKS
DCOMMODITY DBONDS
Variance Decomposition of DSTOCKS
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10
DREIT DHEDGE DSTOCKS
DCOMMODITY DBONDS
Variance Decomposition of DCOMMODITY
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10
DREIT DHEDGE DSTOCKS
DCOMMODITY DBONDS
Variance Decomposition of DBONDS
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10
DREIT DHEDGE DSTOCKS
DCOMMODITY DBONDS