

1 VAR Revision

Consider the three variables: PCR - Private Consumption; GCR - Government Consumption; and URX - Unemployment Rate and define $\mathbf{Y}_t = (l_P CR_t, l_G CR_t, URX_t)'$.

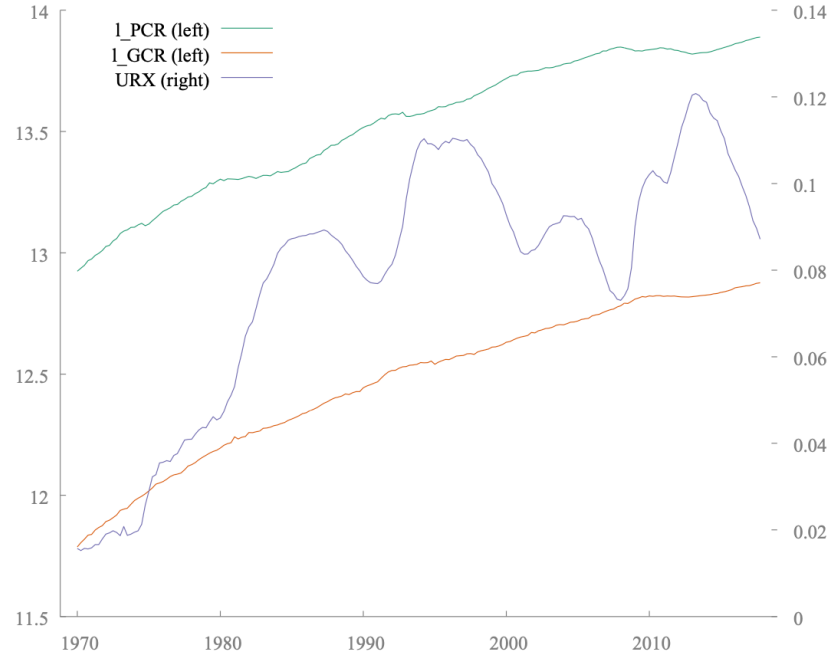


Figure 1

Series are trending, hence nonstationary, but it is important to know whether the nonstationarity is due to a unit root or not. Thus, we apply unit root tests to all three series.

1.1 Unit Root Testing

```
Augmented Dickey-Fuller test for l_PCR
testing down from 14 lags, criterion AIC
sample size 187
unit-root null hypothesis: a = 1

test with constant
including 4 lags of (1-L)l_PCR
model: (1-L)y = b0 + (a-1)*y(-1) + ... + e
estimated value of (a - 1): -0.00372724
test statistic: tau_c(1) = -2.34514
asymptotic p-value 0.1578
1st-order autocorrelation coeff. for e: -0.006
lagged differences: F(4, 181) = 7.178 [0.0000]

with constant and trend
including 4 lags of (1-L)l_PCR
model: (1-L)y = b0 + b1*t + (a-1)*y(-1) + ... + e
estimated value of (a - 1): -0.0106643
test statistic: tau_ct(1) = -1.61859
asymptotic p-value 0.786
1st-order autocorrelation coeff. for e: -0.008
lagged differences: F(4, 180) = 7.463 [0.0000]
```

Figure 2

```
Augmented Dickey-Fuller test for l_GCR
testing down from 14 lags, criterion AIC
sample size 187
unit-root null hypothesis: a = 1

test with constant
including 4 lags of (1-L)l_GCR
model: (1-L)y = b0 + (a-1)*y(-1) + ... + e
estimated value of (a - 1): -0.00609162
test statistic: tau_c(1) = -3.71919
asymptotic p-value 0.003872
1st-order autocorrelation coeff. for e: -0.022
lagged differences: F(4, 181) = 5.757 [0.0002]

with constant and trend
including 4 lags of (1-L)l_GCR
model: (1-L)y = b0 + b1*t + (a-1)*y(-1) + ... + e
estimated value of (a - 1): -0.01292
test statistic: tau_ct(1) = -2.25415
asymptotic p-value 0.4587
1st-order autocorrelation coeff. for e: -0.023
lagged differences: F(4, 180) = 5.643 [0.0003]
```

Figure 3

```

Augmented Dickey-Fuller test for URX
testing down from 14 lags, criterion AIC
sample size 190
unit-root null hypothesis: a = 1

test with constant
including one lag of (1-L)URX
model: (1-L)y = b0 + (a-1)*y(-1) + ... + e
estimated value of (a - 1): -0.00685106
test statistic: tau_c(1) = -2.39467
asymptotic p-value 0.1432
1st-order autocorrelation coeff. for e: -0.100

with constant and trend
including one lag of (1-L)URX
model: (1-L)y = b0 + b1*t + (a-1)*y(-1) + ... + e
estimated value of (a - 1): -0.00949524
test statistic: tau_ct(1) = -1.93244
asymptotic p-value 0.6373
1st-order autocorrelation coeff. for e: -0.108

```

Figure 4

1.2 SVAR estimation

Consider the following SVAR model:

$$\Gamma_0 \mathbf{Y}_t = \boldsymbol{\mu} + \sum_{i=1}^p \Gamma_i \mathbf{Y}_{t-i} + \boldsymbol{\varepsilon}_t \quad (1)$$

For estimation we use the reduced form of the SVAR, i.e.:

$$\begin{aligned}
\Gamma_0 \mathbf{Y}_t &= \boldsymbol{\mu} + \sum_{i=1}^p \Gamma_i \mathbf{Y}_{t-i} + \boldsymbol{\varepsilon}_t \\
\mathbf{Y}_t &= \Gamma_0^{-1} \boldsymbol{\mu} + \sum_{i=1}^p \Gamma_0^{-1} \Gamma_i \mathbf{Y}_{t-i} + \Gamma_0^{-1} \boldsymbol{\varepsilon}_t \\
\mathbf{Y}_t &= A_0 + \sum_{i=1}^p A_i \mathbf{Y}_{t-i} + B \boldsymbol{\varepsilon}_t \\
\mathbf{Y}_t &= A_0 + \sum_{i=1}^p A_i \mathbf{Y}_{t-i} + \mathbf{u}_t
\end{aligned} \quad (2)$$

where $A_0 = \Gamma_0^{-1} \boldsymbol{\mu}$, $A_i = \Gamma_0^{-1} \Gamma_i$, $i = 1, \dots, p$, and $B = \Gamma_0^{-1}$.

Hence, for identification of the SVAR we need to estimate reduced form VAR in (2). Estimation can be done by MLE or equation by equation using OLS. Given the nonstationarity of the data we are going to start with the estimation of a VAR in first differences.

1.2.1 Order identification

VAR system, maximum lag order 8. - FIRST DIFFERENCES

The asterisks below indicate the best (that is, minimized) values of the respective information criteria, AIC = Akaike criterion, BIC = Schwarz Bayesian criterion and HQC = Hannan-Quinn criterion.

lags	loglik	p(LR)	AIC	BIC	HQC
1	2430.47176		-26.431385	-26.220927*	-26.346076
2	2451.21621	0.00000	-26.559740	-26.191438	-26.410449
3	2467.24463	0.00019	-26.636553	-26.110408	-26.423281
4	2488.75468	0.00000	-26.773275	-26.089286	-26.496021*
5	2499.78354	0.00870	-26.795449*	-25.953616	-26.454212
6	2503.93303	0.50432	-26.742438	-25.742762	-26.337220
7	2505.76632	0.93196	-26.664113	-25.506593	-26.194913
8	2513.97846	0.05853	-26.655502	-25.340139	-26.122321

Figure 5

Considering the three Information Criteria AIC, BIC and HQC, we see that each points to a different order of the VAR(p). AIC suggests a VAR(5), BIC suggest a VAR(1) and HQC suggests a VAR(4).

1.2.2 VAR Estimation

VAR(1)

VAR system, lag order 1

OLS estimates, observations 1970:3-2017:4 (T = 190)

Log-likelihood = 2518.2801

Determinant of covariance matrix = 6.1688895e-16

AIC = -26.3819

BIC = -26.1768

HQC = -26.2988

Portmanteau test: LB(47) = 519.494, df = 414 [0.0003]

Equation 1: d_l_PCR

Heteroskedasticity-robust standard errors, variant HC3

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	0.00342661	0.000573935	5.970	<0.0001	***
d_l_PCR_1	0.168015	0.0856345	1.962	0.0513	*
d_l_GCR_1	0.168872	0.0975532	1.731	0.0851	*
d_URX_1	-0.596043	0.209372	-2.847	0.0049	***
Mean dependent var	0.005012	S.D. dependent var		0.005565	
Sum squared resid	0.005071	S.E. of regression		0.005221	
R-squared	0.133719	Adjusted R-squared		0.119747	
F(3, 186)	12.65541	P-value(F)		1.45e-07	
rho	-0.085304	Durbin-Watson		2.165098	

F-tests of zero restrictions:

All lags of d_l_PCR F(1, 186) = 3.8494 [0.0513]

All lags of d_l_GCR F(1, 186) = 2.9966 [0.0851]

All lags of d_URX F(1, 186) = 8.1043 [0.0049]

All vars, lag 1 F(3, 186) = 12.655 [0.0000]

Figure 6

Equation 2: d_l_GCR
Heteroskedasticity-robust standard errors, variant HC3

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	0.00378492	0.000541995	6.983	<0.0001	***
d_l_PCR_1	0.298846	0.0803622	3.719	0.0003	***
d_l_GCR_1	0.0345613	0.104630	0.3303	0.7415	
d_URX_1	0.377100	0.161566	2.334	0.0207	**
Mean dependent var	0.005644	S.D. dependent var		0.004974	
Sum squared resid	0.004161	S.E. of regression		0.004730	
R-squared	0.110144	Adjusted R-squared		0.095791	
F(3, 186)	8.127342	P-value(F)		0.000041	
rho	-0.105421	Durbin-Watson		2.199715	
F-tests of zero restrictions:					
All lags of d_l_PCR	F(1, 186) = 13.829 [0.0003]				
All lags of d_l_GCR	F(1, 186) = 0.10911 [0.7415]				
All lags of d_URX	F(1, 186) = 5.4477 [0.0207]				
All vars, lag 1	F(3, 186) = 8.1273 [0.0000]				

Figure 7

Equation 3: d_URX
Heteroskedasticity-robust standard errors, variant HC3

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	3.23554e-05	0.000141970	0.2279	0.8200	
d_l_PCR_1	-0.0362565	0.0187080	-1.938	0.0541	*
d_l_GCR_1	0.0403979	0.0181995	2.220	0.0276	**
d_URX_1	0.767855	0.0639828	12.00	<0.0001	***
Mean dependent var	0.000379	S.D. dependent var		0.001931	
Sum squared resid	0.000241	S.E. of regression		0.001138	
R-squared	0.658530	Adjusted R-squared		0.653022	
F(3, 186)	53.58349	P-value(F)		5.22e-25	
rho	-0.119410	Durbin-Watson		2.229797	
F-tests of zero restrictions:					
All lags of d_l_PCR	F(1, 186) = 3.7559 [0.0541]				
All lags of d_l_GCR	F(1, 186) = 4.9272 [0.0276]				
All lags of d_URX	F(1, 186) = 144.02 [0.0000]				
All vars, lag 1	F(3, 186) = 53.583 [0.0000]				

Figure 8

Test for autocorrelation of order up to 4

	Rao F	Approx dist.	p-value
lag 1	5.435	F(9, 440)	0.0000
lag 2	3.932	F(18, 503)	0.0000
lag 3	3.677	F(27, 511)	0.0000
lag 4	3.517	F(36, 508)	0.0000

Figure 9

Test for ARCH of order up to 4

	LM	df	p-value
lag 1	84.274	36	0.0000
lag 2	121.762	72	0.0002
lag 3	171.126	108	0.0001
lag 4	214.000	144	0.0001

Figure 10

VAR(4)

VAR system, lag order 4				
OLS estimates, observations 1971:2-2017:4 (T = 187)				
Log-likelihood = 2542.0388				
Determinant of covariance matrix = 3.127236e-16				
AIC = -26.7705				
BIC = -26.0966				
HQC = -26.4974				
Portmanteau test: LB(46) = 391.292, df = 378 [0.3078]				
Equation 1: d_l_PCR				
Heteroskedasticity-robust standard errors, variant HC3				
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>
const	0.000749869	0.000631040	1.188	0.2363
d_l_PCR_1	-0.00428587	0.0931728	-0.04600	0.9634
d_l_PCR_2	0.161027	0.0805779	1.998	0.0472 **
d_l_PCR_3	0.159473	0.105859	1.506	0.1338
d_l_PCR_4	0.175406	0.0944164	1.858	0.0649 *
d_l_GCR_1	-0.0151193	0.0876023	-0.1726	0.8632
d_l_GCR_2	0.126740	0.0809851	1.565	0.1194
d_l_GCR_3	0.108946	0.0994260	1.096	0.2747
d_l_GCR_4	0.0781078	0.0964088	0.8102	0.4189
d_URX_1	-0.978974	0.370183	-2.645	0.0089 ***
d_URX_2	0.718968	0.434678	1.654	0.0999 *
d_URX_3	-0.324072	0.381310	-0.8499	0.3966
d_URX_4	0.459169	0.270849	1.695	0.0918 *
Mean dependent var	0.004889	S.D. dependent var		0.005486
Sum squared resid	0.003850	S.E. of regression		0.004704
R-squared	0.312065	Adjusted R-squared		0.264622
F(12, 174)	6.725895	P-value(F)		7.13e-10
rho	-0.025594	Durbin-Watson		2.048922
F-tests of zero restrictions:				
All lags of d_l_PCR	F(4, 174) = 2.9405 [0.0220]			
All lags of d_l_GCR	F(4, 174) = 0.88121 [0.4764]			
All lags of d_URX	F(4, 174) = 2.46 [0.0472]			
All vars, lag 4	F(3, 174) = 2.2197 [0.0876]			

Figure 11

Equation 2: d_l_GCR					
Heteroskedasticity-robust standard errors, variant HC3					
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	0.00141752	0.000594055	2.386	0.0181	**
d_l_PCR_1	0.134657	0.0788851	1.707	0.0896	*
d_l_PCR_2	0.131622	0.0804896	1.635	0.1038	
d_l_PCR_3	0.0539787	0.0904664	0.5967	0.5515	
d_l_PCR_4	0.139304	0.0817755	1.703	0.0903	*
d_l_GCR_1	-0.188359	0.102392	-1.840	0.0675	*
d_l_GCR_2	0.0277204	0.0689274	0.4022	0.6881	
d_l_GCR_3	0.189429	0.0922384	2.054	0.0415	**
d_l_GCR_4	0.273713	0.0885348	3.092	0.0023	***
d_URX_1	0.395743	0.331347	1.194	0.2340	
d_URX_2	0.340396	0.396611	0.8583	0.3919	
d_URX_3	-0.101672	0.409616	-0.2482	0.8043	
d_URX_4	-0.403153	0.291988	-1.381	0.1691	
Mean dependent var	0.005552	S.D. dependent var		0.004907	
Sum squared resid	0.002862	S.E. of regression		0.004055	
R-squared	0.361086	Adjusted R-squared		0.317023	
F(12, 174)	7.092947	P-value(F)		1.91e-10	
rho	-0.073552	Durbin-Watson		2.143635	
F-tests of zero restrictions:					
All lags of d_l_PCR	F(4, 174) = 1.7654 [0.1379]				
All lags of d_l_GCR	F(4, 174) = 4.451 [0.0019]				
All lags of d_URX	F(4, 174) = 1.6519 [0.1634]				
All vars, lag 4	F(3, 174) = 5.6828 [0.0010]				

Figure 12

Equation 3: d_URX					
Heteroskedasticity-robust standard errors, variant HC3					
	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-9.57098e-05	0.000202393	-0.4729	0.6369	
d_l_PCR_1	-0.0552403	0.0218004	-2.534	0.0122	**
d_l_PCR_2	-0.0530721	0.0194635	-2.727	0.0071	***
d_l_PCR_3	-0.0122085	0.0212036	-0.5758	0.5655	
d_l_PCR_4	-0.0128539	0.0201750	-0.6371	0.5249	
d_l_GCR_1	0.0359075	0.0206060	1.743	0.0832	*
d_l_GCR_2	0.0111331	0.0235886	0.4720	0.6375	
d_l_GCR_3	0.0644515	0.0226136	2.850	0.0049	***
d_l_GCR_4	0.0453393	0.0191269	2.370	0.0189	**
d_URX_1	0.586874	0.124945	4.697	<0.0001	***
d_URX_2	0.106125	0.126641	0.8380	0.4032	
d_URX_3	0.0199550	0.0996021	0.2003	0.8414	
d_URX_4	-0.0729299	0.0794322	-0.9181	0.3598	
Mean dependent var	0.000381	S.D. dependent var		0.001946	
Sum squared resid	0.000209	S.E. of regression		0.001096	
R-squared	0.703359	Adjusted R-squared		0.682901	
F(12, 174)	21.10824	P-value(F)		4.24e-28	
rho	-0.001656	Durbin-Watson		1.998503	
F-tests of zero restrictions:					
All lags of d_l_PCR	F(4, 174) = 2.9716 [0.0209]				
All lags of d_l_GCR	F(4, 174) = 3.0702 [0.0178]				
All lags of d_URX	F(4, 174) = 21.581 [0.0000]				
All vars, lag 4	F(3, 174) = 2.2982 [0.0792]				

Figure 13

Test for autocorrelation of order up to 4

	Rao F	Approx dist.	p-value
lag 1	1.696	F(9, 411)	0.0878
lag 2	1.695	F(18, 470)	0.0369
lag 3	1.269	F(27, 476)	0.1675
lag 4	1.189	F(36, 473)	0.2131

Figure 14

Test for ARCH of order up to 4

	LM	df	p-value
lag 1	57.322	36	0.0134
lag 2	99.287	72	0.0183
lag 3	153.813	108	0.0025
lag 4	182.671	144	0.0162

Figure 15

1.3 IRFs

Short-run restrictions used for identification

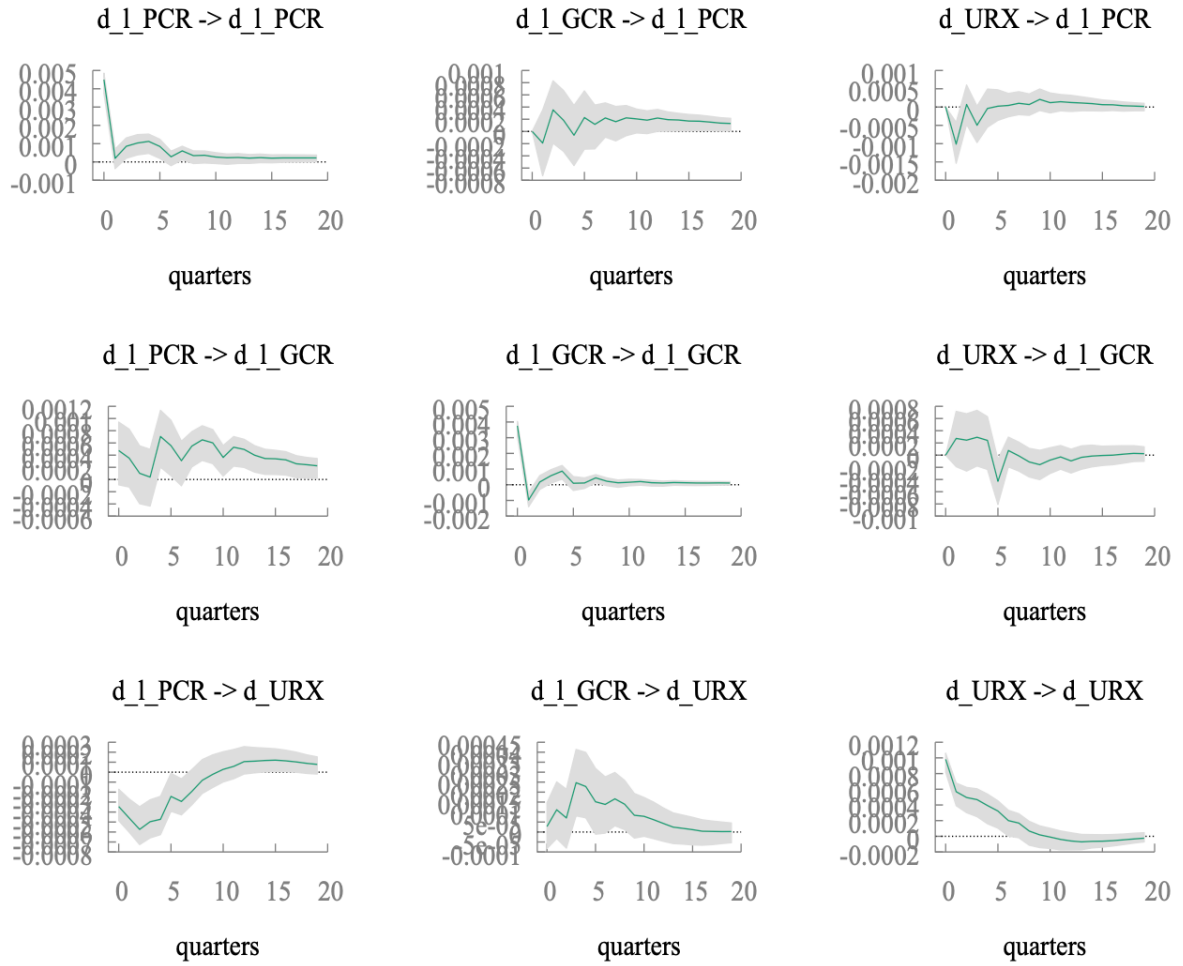


Figure 16

1.4 Forecast Variance Decomposition

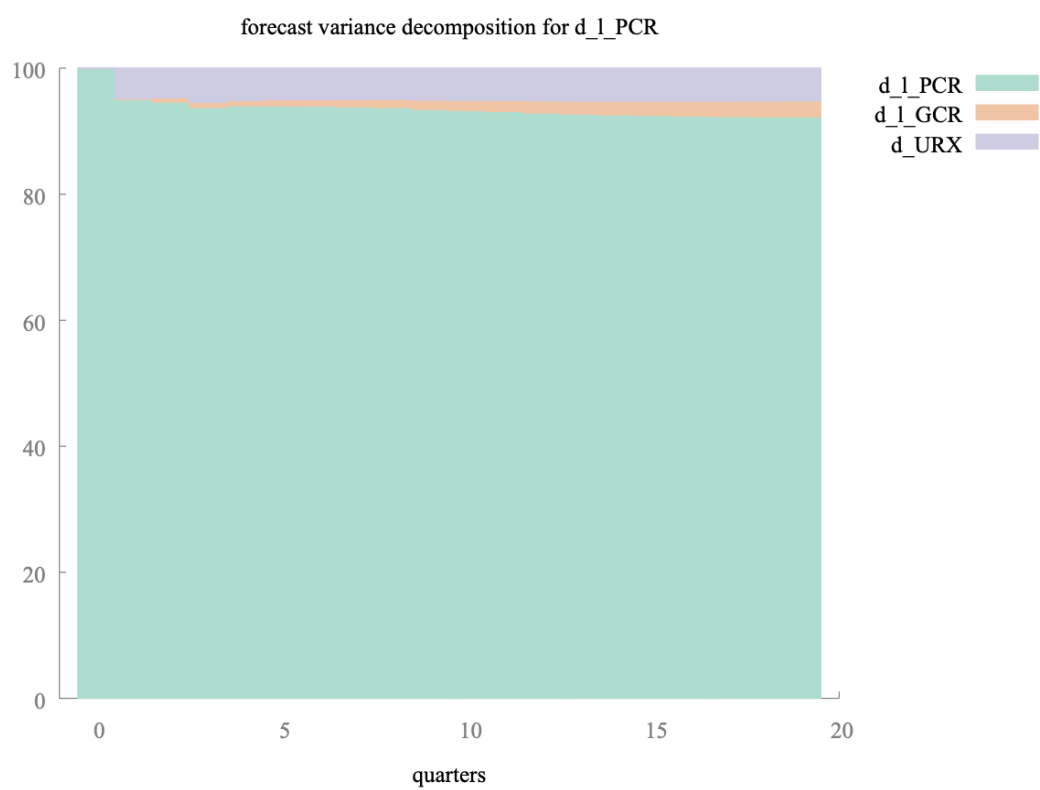


Figure 17

2 Analysis in Levels

2.1 Johansen Test

```

Johansen test:
Number of equations = 3
Lag order = 2
Estimation period: 1970:3 - 2017:4 (T = 190)
Case 3: Unrestricted constant

Log-likelihood = 3113.75 (including constant term: 2574.56)

Rank Eigenvalue Trace test p-value Lmax test p-value
  0    0.38829    112.55 [0.0000]    93.384 [0.0000]
  1    0.086186    19.167 [0.0120]    17.124 [0.0153]
  2    0.010694     2.0427 [0.1529]     2.0427 [0.1529]

Corrected for sample size (df = 183)
Rank Trace test p-value
  0    112.55 [0.0000]
  1    19.167 [0.0125]
  2     2.0427 [0.1556]

eigenvalue      0.38829      0.086186      0.010694

beta (cointegrating vectors)
l_PCR           5.3570      -6.5243           55.936
l_GCR           -8.2943     -0.24743          -56.577
URX            -11.260       62.667           75.100

alpha (adjustment vectors)
l_PCR           0.0022307    0.0010626    9.0883e-05
l_GCR           0.0024042   -0.00062420   0.00016335
URX            0.00017414  -0.00012074  -0.00010442

renormalized beta
l_PCR           1.0000       26.369           0.74483
l_GCR           -1.5483       1.0000          -0.75336
URX            -2.1020      -253.28           1.0000

renormalized alpha
l_PCR           0.011950   -0.00026291    0.0068253
l_GCR           0.012879    0.00015444     0.012268
URX            0.00093288    2.9875e-05   -0.0078417

long-run matrix (alpha * beta')
              l_PCR      l_GCR      URX
l_PCR         0.010101   -0.023906    0.048297
l_GCR         0.026089   -0.029028   -0.053921
URX          -0.0041200    0.0044931   -0.017369

```

Figure 18

2.2 VECM

VECM system, lag order 5
Maximum likelihood estimates, observations 1971:2-2017:4 (T = 187)
Cointegration rank = 2
Case 3: Unrestricted constant
beta (cointegrating vectors, standard errors in parentheses)

1_PCR	1.0000	0.0000
	(0.0000)	(0.0000)
1_GCR	0.0000	1.0000
	(0.0000)	(0.0000)
URX	-15.374	-8.7439
	(3.8044)	(2.3238)

alpha (adjustment vectors)

1_PCR	0.0027316	-0.013316
1_GCR	0.011415	-0.015245
URX	0.0021127	-0.0030092

Log-likelihood = 2563.0306
Determinant of covariance matrix = 2.4983701e-16
AIC = -26.8987
BIC = -26.0693
HQC = -26.5627

Figure 19

Equation 1: d_1_PCR

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	0.125679	0.0361189	3.480	0.0006	***
d_1_PCR_1	-0.0928441	0.0812984	-1.142	0.2550	
d_1_PCR_2	0.0608322	0.0841267	0.7231	0.4706	
d_1_PCR_3	0.0591554	0.0857393	0.6899	0.4912	
d_1_PCR_4	0.0946777	0.0835407	1.133	0.2587	
d_1_GCR_1	-0.00186873	0.0855538	-0.02184	0.9826	
d_1_GCR_2	0.147581	0.0887763	1.662	0.0983	*
d_1_GCR_3	0.136120	0.0881999	1.543	0.1246	
d_1_GCR_4	0.105675	0.0860775	1.228	0.2212	
d_URX_1	-1.18812	0.338536	-3.510	0.0006	***
d_URX_2	0.531721	0.381086	1.395	0.1647	
d_URX_3	-0.434389	0.375009	-1.158	0.2483	
d_URX_4	0.245654	0.310672	0.7907	0.4302	
EC1	0.00273161	0.00325823	0.8384	0.4030	
EC2	-0.0133159	0.00523215	-2.545	0.0118	**
Mean dependent var	0.004889	S.D. dependent var		0.005486	
Sum squared resid	0.003597	S.E. of regression		0.004573	
R-squared	0.357409	Adjusted R-squared		0.305105	
rho	-0.013521	Durbin-Watson		2.025727	

Figure 20

Equation 2: d_1_GCR

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	0.0446296	0.0307381	1.452	0.1483	
d_1_PCR_1	0.0815759	0.0691872	1.179	0.2400	
d_1_PCR_2	0.0550923	0.0715941	0.7695	0.4426	
d_1_PCR_3	-0.0409216	0.0729665	-0.5608	0.5756	
d_1_PCR_4	0.0523274	0.0710954	0.7360	0.4627	
d_1_GCR_1	-0.283768	0.0728086	-3.897	0.0001	***
d_1_GCR_2	-0.0893289	0.0755510	-1.182	0.2387	
d_1_GCR_3	0.0678537	0.0750605	0.9040	0.3673	
d_1_GCR_4	0.182048	0.0732543	2.485	0.0139	**
d_URX_1	0.143326	0.288104	0.4975	0.6195	
d_URX_2	0.198116	0.324314	0.6109	0.5421	
d_URX_3	-0.103686	0.319143	-0.3249	0.7457	
d_URX_4	-0.483662	0.264391	-1.829	0.0691	*
EC1	0.0114147	0.00277285	4.117	<0.0001	***
EC2	-0.0152445	0.00445270	-3.424	0.0008	***
Mean dependent var	0.005552	S.D. dependent var		0.004907	
Sum squared resid	0.002605	S.E. of regression		0.003892	
R-squared	0.418398	Adjusted R-squared		0.371058	
rho	-0.040895	Durbin-Watson		2.079184	

Figure 21

Equation 3: d_URX

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	0.0101258	0.00852045	1.188	0.2363	
d_1_PCR_1	-0.0665368	0.0191783	-3.469	0.0007	***
d_1_PCR_2	-0.0688257	0.0198455	-3.468	0.0007	***
d_1_PCR_3	-0.0312793	0.0202259	-1.546	0.1238	
d_1_PCR_4	-0.0301147	0.0197073	-1.528	0.1283	
d_1_GCR_1	0.0189485	0.0201822	0.9389	0.3491	
d_1_GCR_2	-0.00958349	0.0209423	-0.4576	0.6478	
d_1_GCR_3	0.0430410	0.0208064	2.069	0.0401	**
d_1_GCR_4	0.0293337	0.0203057	1.445	0.1504	
d_URX_1	0.537268	0.0798608	6.728	<0.0001	***
d_URX_2	0.0768178	0.0898982	0.8545	0.3940	
d_URX_3	0.0174510	0.0884647	0.1973	0.8439	
d_URX_4	-0.0916004	0.0732877	-1.250	0.2130	
EC1	0.00211273	0.000768618	2.749	0.0066	***
EC2	-0.00300918	0.00123426	-2.438	0.0158	**
Mean dependent var	0.000381	S.D. dependent var		0.001946	
Sum squared resid	0.000200	S.E. of regression		0.001079	
R-squared	0.715936	Adjusted R-squared		0.692814	
rho	0.008314	Durbin-Watson		1.979176	

Cross-equation covariance matrix:

	1_PCR	1_GCR	URX
1_PCR	1.9233e-05	2.1048e-06	-1.5326e-06
1_GCR	2.1048e-06	1.3930e-05	-1.6839e-07
URX	-1.5326e-06	-1.6839e-07	1.0703e-06

determinant = 2.49837e-16

Figure 22

Test for autocorrelation of order up to 4

	Rao F	Approx dist.	p-value
lag 1	1.313	F(9, 411)	0.2276
lag 2	1.159	F(18, 470)	0.2915
lag 3	1.012	F(27, 476)	0.4495
lag 4	1.105	F(36, 473)	0.3147

Figure 23

Test for ARCH of order up to 4

	LM	df	p-value
lag 1	65.711	36	0.0018
lag 2	98.656	72	0.0203
lag 3	138.767	108	0.0246
lag 4	168.039	144	0.0833

Figure 24

2.3 IRFs

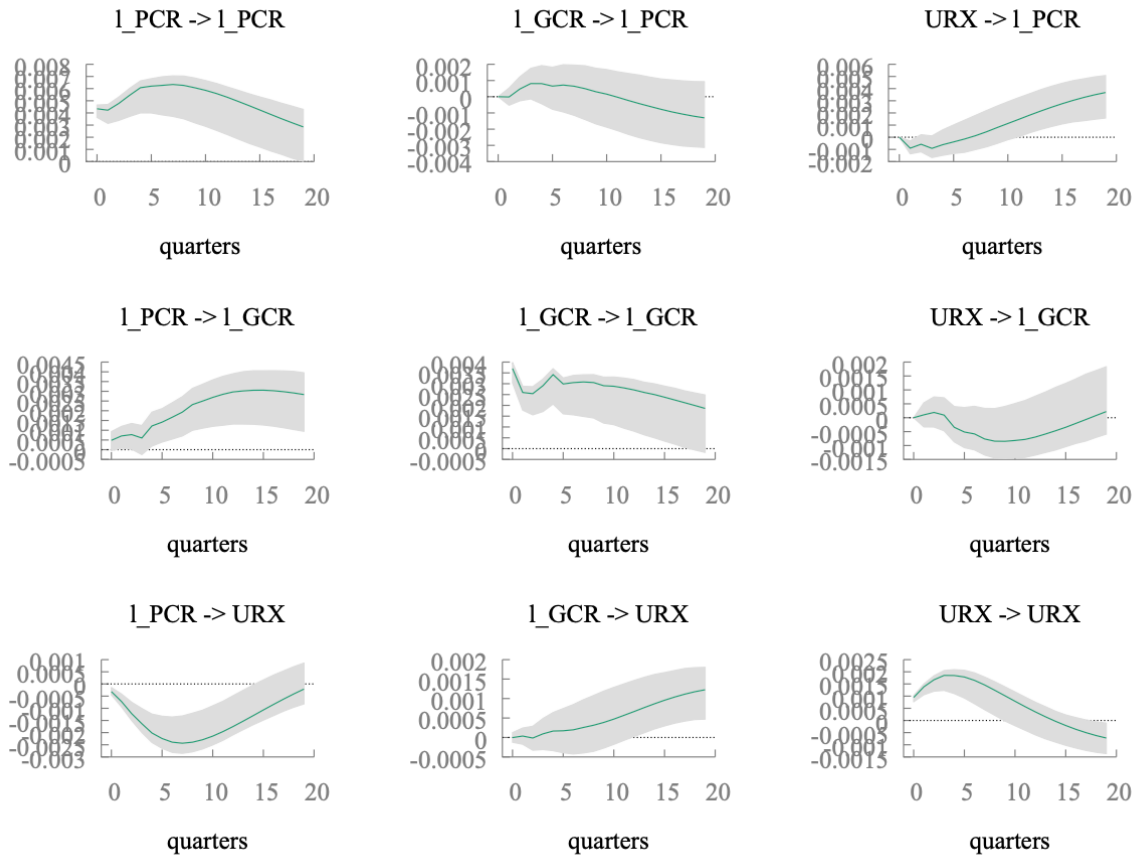


Figure 25