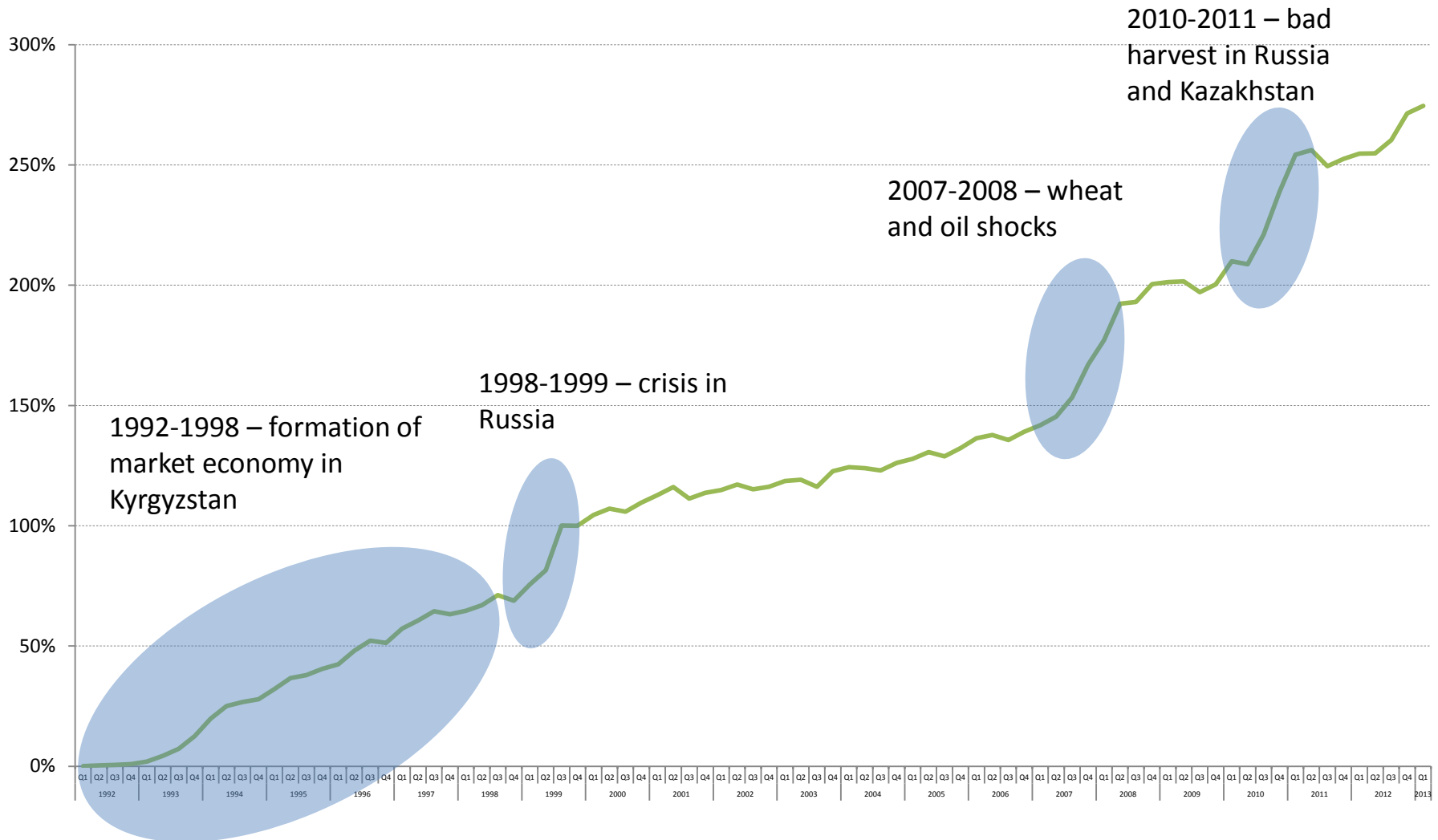


Inflation modeling in the Kyrgyz Republic

**Azat Kozubekov
National Bank of the Kyrgyz Republic**

The Behavior of Inflation in Kyrgyzstan

(1992-2013)

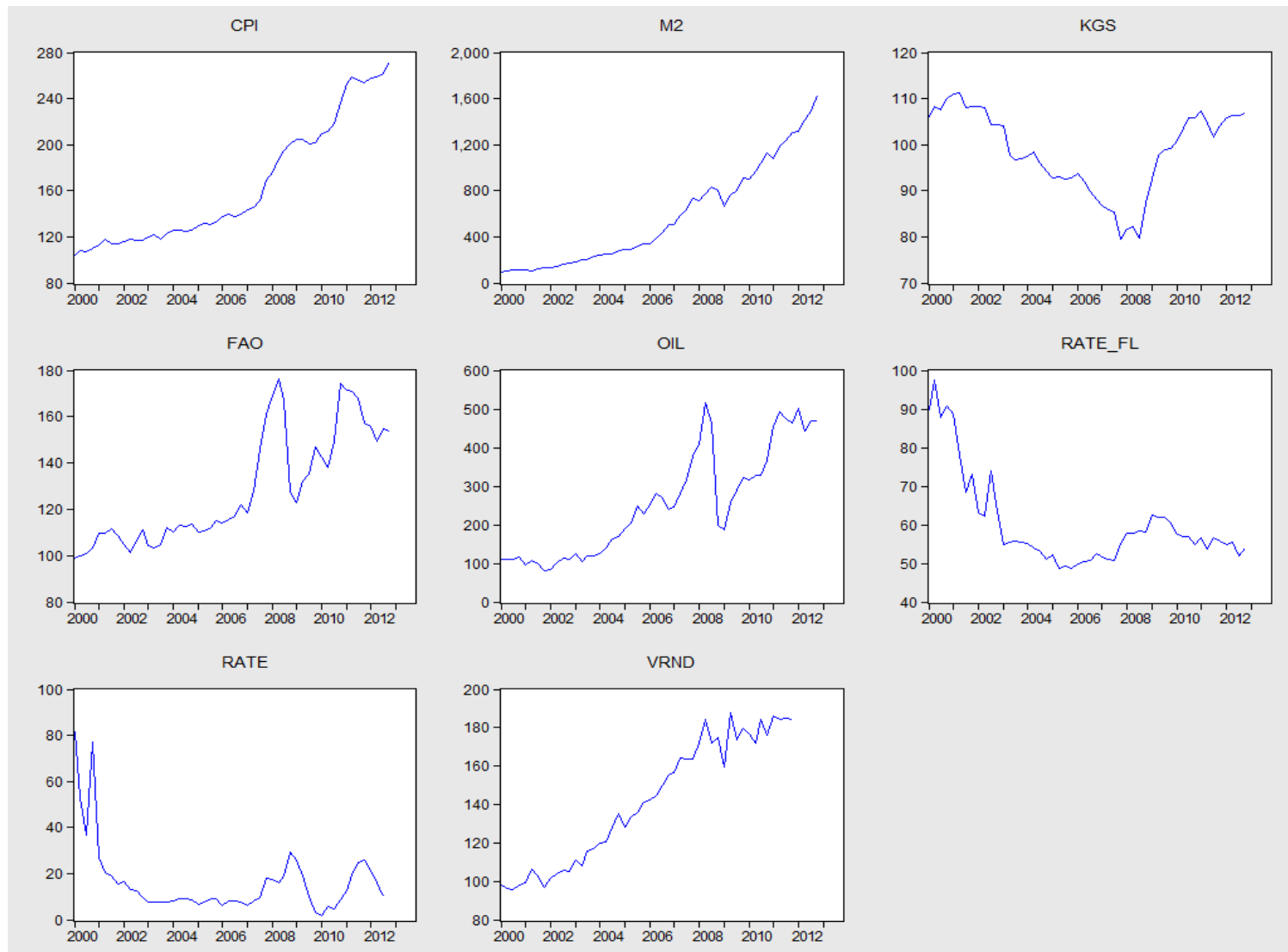


* (4Q 1999 = 100)

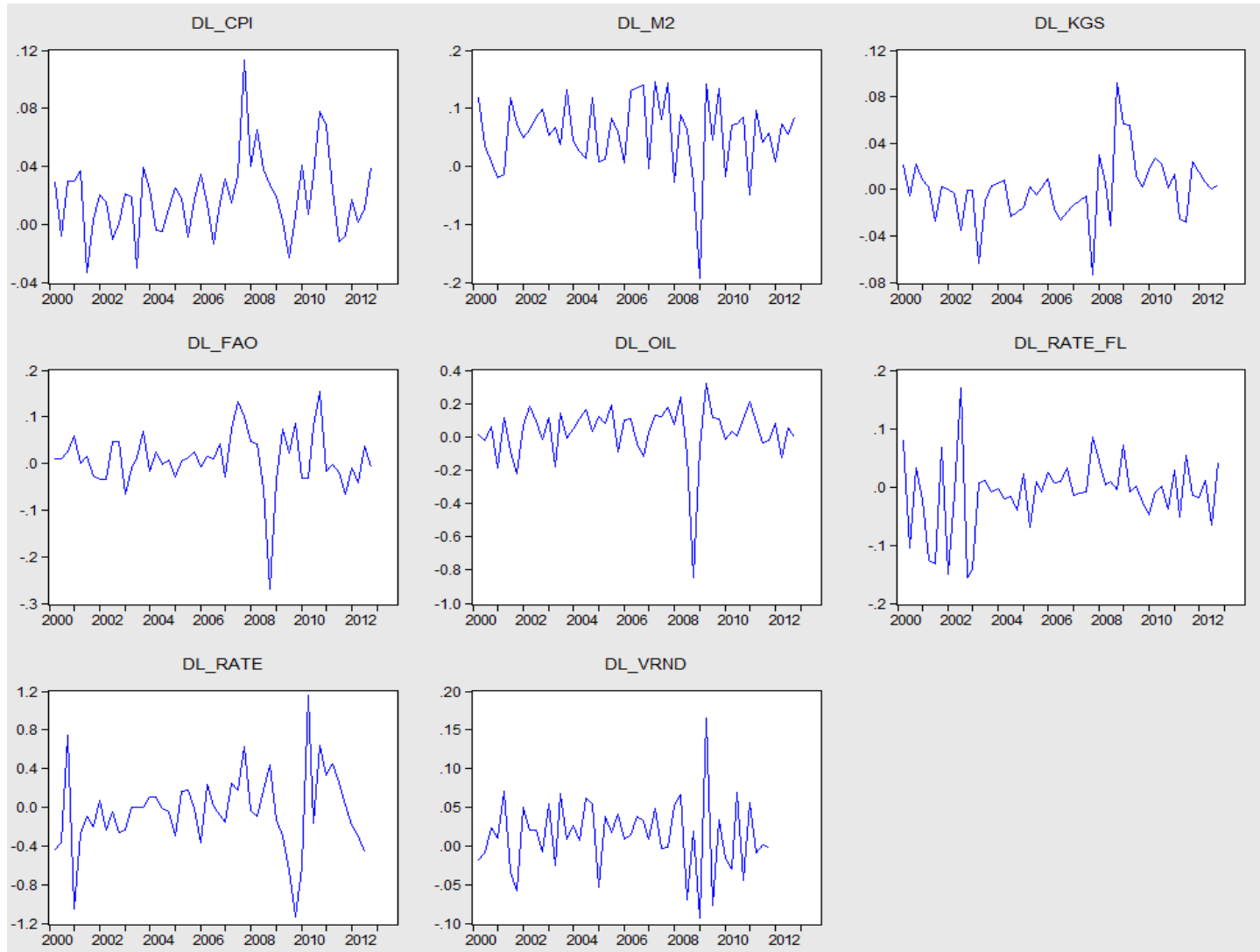
Related Macroeconomic Variables

- Nominal exchange rate (**KGS**) – which shows the dynamics of change of price of one US dollar vis-à-vis Kyrgyz soms;
- Monetary aggregate M2 (**M2**) – the broadest monetary aggregate in national currency;
- World commodity price dynamics of the Food and Agriculture Organization of UN (**FAO**) – is the most relevant estimation of world commodity price index which affect domestic price level. The first includes dynamics of five the most wide spread agricultural goods (grains, sugar, vegetable oil milk and meat);
- Fuel price dynamics (**OIL**) – is based on prices of Brent oil as the price delivered to the Kyrgyz Republic is formed based of the price changes on this particular sort;
- Gross disposable national income (**VRND**) – is an estimate of aggregate volume of resources or income of Kyrgyz economy which is formed from all sources, particularly:
- **VRND** = *GDP + Factor incomes from abroad + Transfers (including remittances)*
- Interest on loans (**RATE_FL**) – is a weighted average interest rate on loans of commercial banks for a period;
- Discount rate of the National bank (**RATE**) – is an weighted average of return on 28 day the NBKR Notes for the last 4 auctions, this variables is accounted as a policy rate of the National bank.

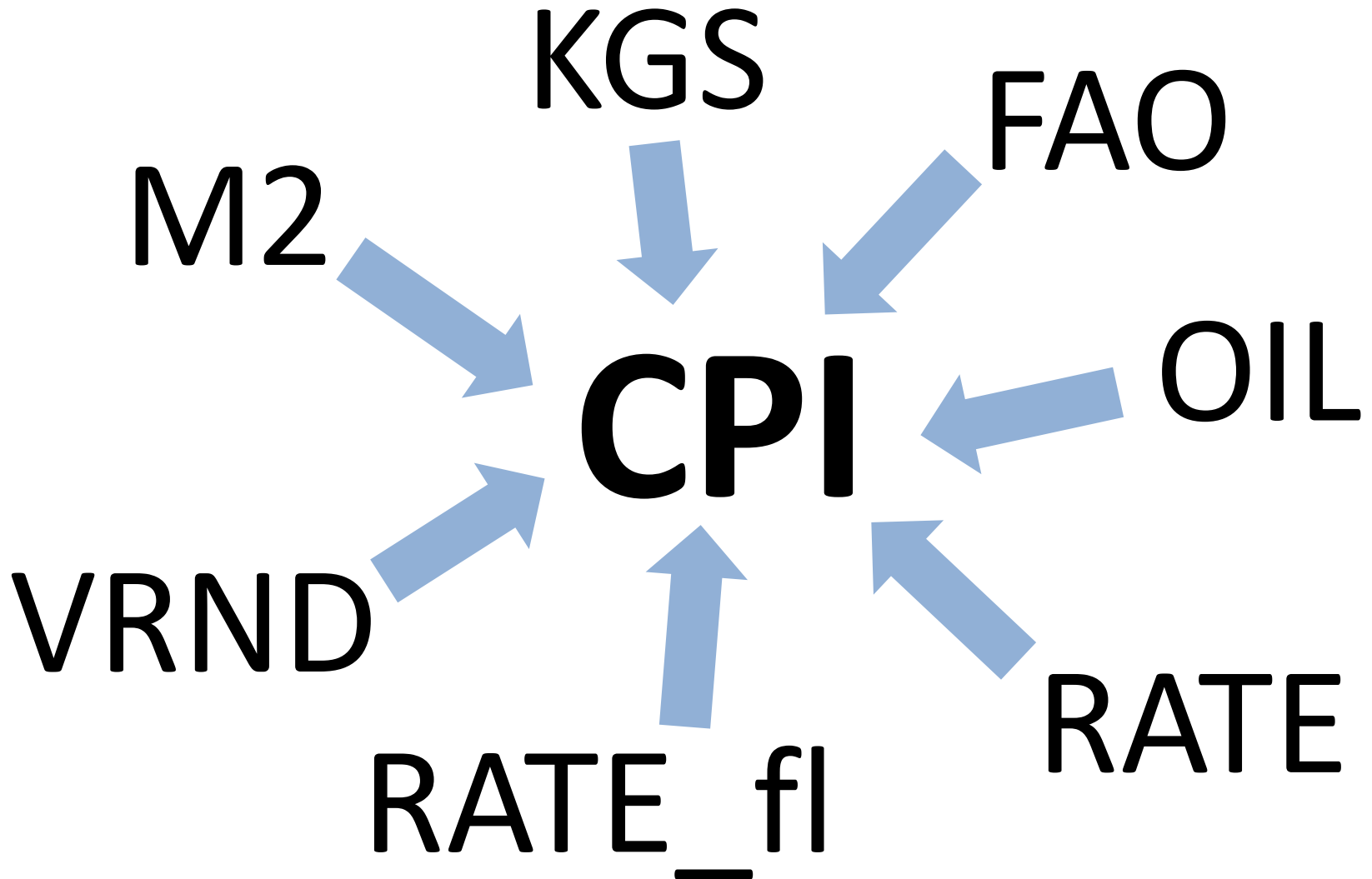
Dynamics of variables used in the model



Dynamics of variables used in the model



Inflation model parameterization



Inflation model (based on OLS)

Dependent Variable: DLOG(CPI)

Method: Least Squares

Date: 05/22/13 Time: 16:47

Sample (adjusted): 2001Q2 2012Q4

Included observations: 47 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(FAO(-1))	0.162554	0.056238	2.890441	0.0062
DLOG(OIL(-3))	0.033359	0.019125	1.744234	0.0888
DLOG(M2(-2))	0.119059	0.048707	2.444401	0.0190
DLOG(KGS(-1))	0.314314	0.112625	2.790798	0.0080
DLOG(RATE(-4))	-0.008586	0.006683	-1.284725	0.2063
DUMMY	0.031316	0.008657	3.617273	0.0008
C	0.005025	0.003507	1.432702	0.1597
R-squared	0.652870	Mean dependent var		0.018611
Adjusted R-squared	0.600801	S.D. dependent var		0.027394
S.E. of regression	0.017308	Akaike info criterion		-5.138643
Sum squared resid	0.011983	Schwarz criterion		-4.863089
Log likelihood	127.7581	Hannan-Quinn criter.		-5.034950
F-statistic	12.53846	Durbin-Watson stat		2.067956
Prob(F-statistic)	0.000000			

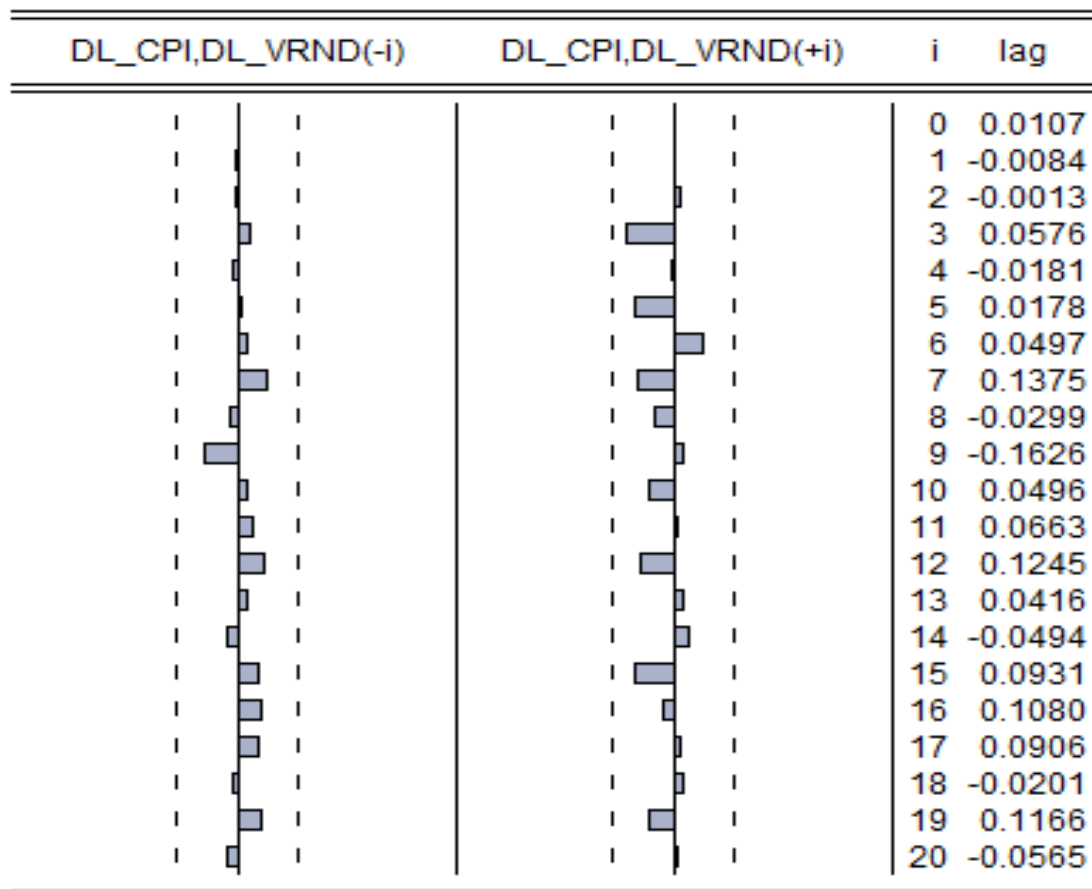
Cross Correlation Test between CPI and VRND

Date: 05/02/13 Time: 14:03

Sample: 2000Q1 2013Q4

Included observations: 47

Correlations are asymptotically consistent approximations



Effect of VRND on the nominal exchange rate (KGS)

Date: 05/22/13 Time: 19:38

Sample: 2000Q1 2013Q4

Included observations: 47

Correlations are asymptotically consistent approximations

DL_KGS,DL_VRND(-i)	DL_KGS,DL_VRND(+i)	i	lag
		0	0.1314
		1	-0.3592
		2	-0.1342
		3	0.1007
		4	-0.0339
		5	-0.0160
		6	0.0246
		7	0.0845
		8	-0.0965
		9	0.0331
		10	0.0668
		11	0.1031
		12	0.0605
		13	-0.0885
		14	0.1354
		15	-0.0740
		16	0.0113
		17	-0.0331
		18	0.1626
		19	0.0486
		20	0.0319

Dependent Variable: DLOG(KGS)

Method: Least Squares

Date: 05/22/13 Time: 15:32

Sample (adjusted): 2000Q3 2012Q1

Included observations: 47 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(VRND(-1))	-0.218311	0.083188	-2.624311	0.0118
C	0.002414	0.003988	0.605298	0.5480
R-squared	0.132731	Mean dependent var		-0.000505
Adjusted R-squared	0.113458	S.D. dependent var		0.027888
S.E. of regression	0.026258	Akaike info criterion		-4.400051
Sum squared resid	0.031027	Schwarz criterion		-4.321322
Log likelihood	105.4012	Hannan-Quinn criter.		-4.370425
F-statistic	6.887007	Durbin-Watson stat		1.624169
Prob(F-statistic)	0.011816			

Correlation between M2, VRND and RATE_fl

Dependent Variable: DLOG(M2)

Method: Least Squares

Date: 05/22/13 Time: 15:34

Sample (adjusted): 2001Q2 2011Q4

Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(VRND)	0.329654	0.200206	1.646569	0.1075
DLOG(RATE_FL(-4))	-0.273311	0.149279	-1.830878	0.0746
C	0.049876	0.010121	4.927794	0.0000
R-squared	0.133337	Mean dependent var		0.057780
Adjusted R-squared	0.090004	S.D. dependent var		0.065670
S.E. of regression	0.062645	Akaike info criterion		-2.635451
Sum squared resid	0.156976	Schwarz criterion		-2.512576
Log likelihood	59.66219	Hannan-Quinn criter.		-2.590138
F-statistic	3.077017	Durbin-Watson stat		2.288420
Prob(F-statistic)	0.057149			

Combined regression model of inflation (based on two-stage OLS)

$$\text{DLOG(CPI)} = 0.16 * \text{DLOG(FAO(-1))} + 0.03 * \text{DLOG(OIL(-3))} + 0.12 * \text{DLOG(M2(-2))} + 0.31 * \text{DLOG(KGS(-1))} - 0.01 * \text{DLOG(RATE(-4))} + 0.03 * \text{DUMMY} + 0.01$$

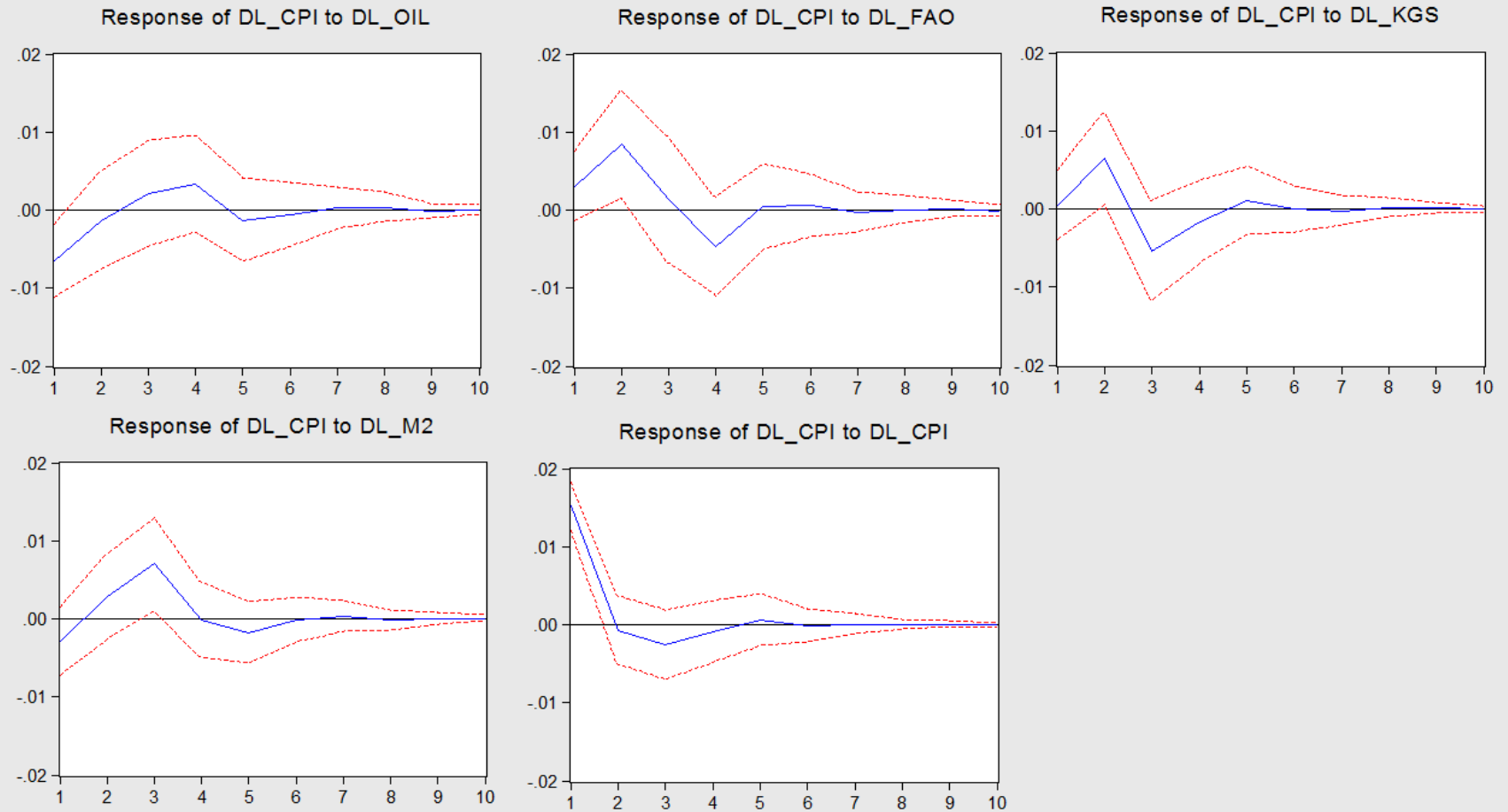
$$\text{DLOG(KGS)} = -0.22 * \text{DLOG(VRND(-1))} + 0.01$$

$$\text{DLOG(M2)} = 0.12 * \text{DLOG(VRND)} - 0.28 * \text{DLOG(RATE_FL(-4))} + 0.05$$

$$\text{DLOG(RATE_FL)} = 0.06 * \text{DLOG(RATE(-1))} - 0.01$$

VAR model of inflation in Kyrgyzstan

Response to Cholesky One S.D. Innovations ± 2 S.E.



Conclusion

Summarizing the evaluation and conclusions based on different modeling techniques, we can say that in this paper describes the basic mechanisms of the effect of inflation factors and their interaction with each other. Furthermore, these developments will be an acceptable instrument of short-term forecasting. Further work on the model of inflation will continue, including the use of new methods of modeling and forecasting.

Thank You!