研究报告

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VAR

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TSINGHUA PBCSF 清华五道口 | NIFR 国家金融研究院

Research report

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Deleveraging should take a gradual approach: Evidence from the Macro influencing Factor of Non-performing Loan rate

Center for Finance and Development

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Abstract

The pace and intensity of deleveraging are currently causing policy maker and market concerns. In order to provide scientific basis for policy making in the prevention of financial risks, this paper, by establishing dynamic panel and non-balanced panel VAR model, analyzes the impact of factors such as falling house prices and economic slowdown on bank's non-performing loan ratios. The study found that: (1) Deleveraging cannot be accomplished very quickly, and its pace and intensity must be measured. The downward trend of economic growth may be the biggest risk facing the rising non-performing loan ratios of Chinese banks; (2) The impulse response of house price decline shows that non-performing loan ratios of rural commercial banks are the most sensitive, followed by city commercial banks, and the listed banks are least affected; (3) The results of variance decomposition of non-performing loan ratios demonstrate that monetary policy is transmitted more quickly in listed banks, but much slower in city commercial banks and rural commercial banks.

The main reason for this may be that the main body of their clients are insensitive to interest rate changes due to soft budget constraints. Therefore, gradually hardening the budget constraints for local governments and the financing platforms may be necessary to prevent and resolve systemic financial risks in the future.

2018

IMF 2017 12 FSAP

2018 3

2018 4 27

5 4

2018 7 31

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IMF 2017 FSSA

33

2 7 3

1 5 9 1

Nkusu 2011 1998 2009 26

VAR PVAR

Klein 2013 1998 2011

VAR

Beck et al 2013 2000 2010 75

Beaton et al 2016 6 34 1996 2015

IMF 2017 FSSA

IMF 2017

[1]

PVAR Wind 108

1

2

VAR

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3

wind 2003 2017

108

2003

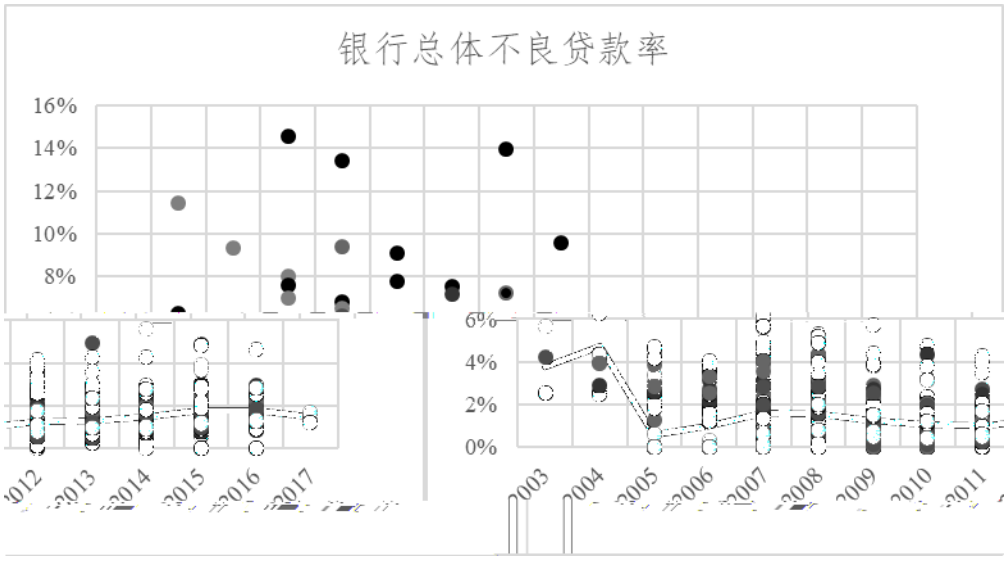
2014 2016

2017

2003 2011

2006 14 5

2017 19 5



wind

1

shibor 2007

Chibor

GDP 1

	8.25%	5.69%	-1.67%	20.85%
	7.04	0.802	6.14	8.28
	2.40%	0.64%	1.07%	3.51%
	1.02	0.085	0.88	1.16
GDP	9.4%	2.23%	6.7%	14.2%

wind

PVAR

2009

2003 2008

Chibor

$$NPL_{i,t} = \mathcal{D}NPL_{i,t\ 1} \quad E_0 \quad x_t' E \quad u_i \quad H_{it} \qquad t \quad 2,\cdots,T \qquad 1$$

$NPL_{i,t}$ i t

$$x_t = \begin{matrix} ' \ln fj_t \\ gr_t \\ rate_t \\ qrbl_t \\ exchangerate_t \end{matrix} \quad \begin{matrix} a \\ « \\ « \\ « \\ « \end{matrix}$$

t

$' \ln fj_t$ gr_t GDP $rate_t$

$qrbl_t$ $exchangerate_t$

$$\begin{matrix} E_1 \\ E_2 \\ E_3 \\ E_4 \\ E_5 \end{matrix} \quad \begin{matrix} a \\ « \\ « \\ « \\ « \end{matrix}$$

u_i H_{it} $Cov(\ _{it}, H_{is}) H\ 0, t \quad s,$

i 1

H_{it}

NPL VAR

NPL

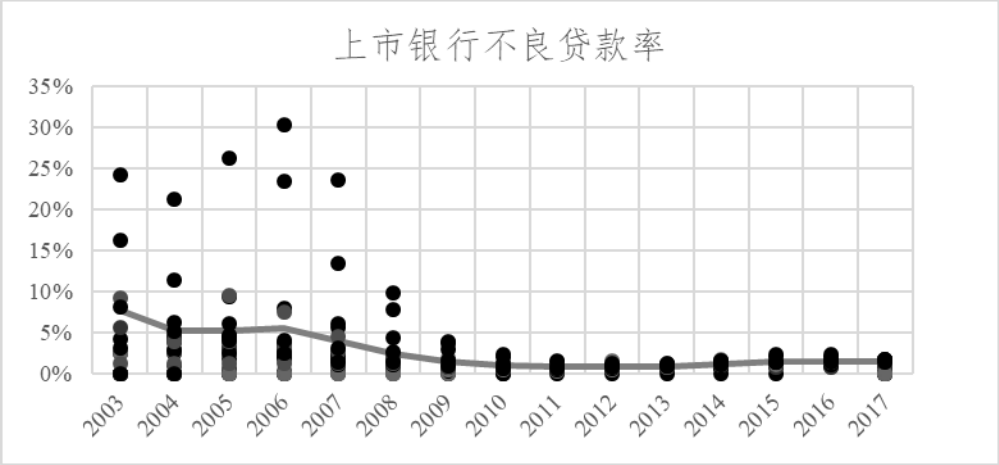
$$\begin{cases} Y_{i,t} = Y_{i,t-1}A_1 + Y_{i,t-2}A_2 + \cdots + Y_{i,t-p-1}A_{p-1} + Y_{i,t-p}A_p + X_{it}B + u_{it} + e_{it} \\ t = 1,2,\cdots,T_i; i = 1,2,\cdots,N. \end{cases} \quad (2)$$

$Y_{i,t} = [NPL_{i,t}, \ln fj_t, gr_t, rate]'$ X_{it}

$A_1, A_2, \cdots, A_p, B$ u_{it}

e_{it} GMM

Holtz Eakin et al 1988



			GMM		GMM	
NPL(1)	0.632***	0.631***	0.755***	0.6279***	0.7208***	0.6309***
	0.0189	0.0191	0.0798	0.0371	0.0050	0.0052
qrbl	0.0282***	0.0291.***	0.037***	0.0285***	0.0418***	0.0389***
	0.0045	0.00565	0.0098	0.0102	0.6458	0.0007

gr	-0.1086*** 0.0164	-0.106*** 0.0182	-0.1121*** 0.0155	-0.105*** 0.0130	-0.0976**** 0.0026	-0.0895*** 0.0025
exchangerate	0.0058*** 0.282	0.00570*** 0 .0007	0.0024 0.0016	0.0056*** 0.0015	0.0036*** 0.0002	0.0054*** 0.0002
' ln *fj*		-0.00235*** 0.00450		-0.00142 0.0071		-0.0016*** 0.0006
rate		-0.023** 0.0466		-0.0093 0.0277		-0.0413*** 0.0115
C	-0.0542 0.0074	-0.0542 0.0078	-0.0428** 0.0175	0.0533 0.0191	-0.0562*** 0.0021	-0.0637 0.0015
within	0.0.8975	0.8976				
between	0.9181	0.9178				
			28	31	41	44
Sargan p					0.8041	0.8310
A-B AR(1)p-					0.000	0.000
A-B AR(2)p-					0.2868	0.2232

0 01 0 05 0 1

30

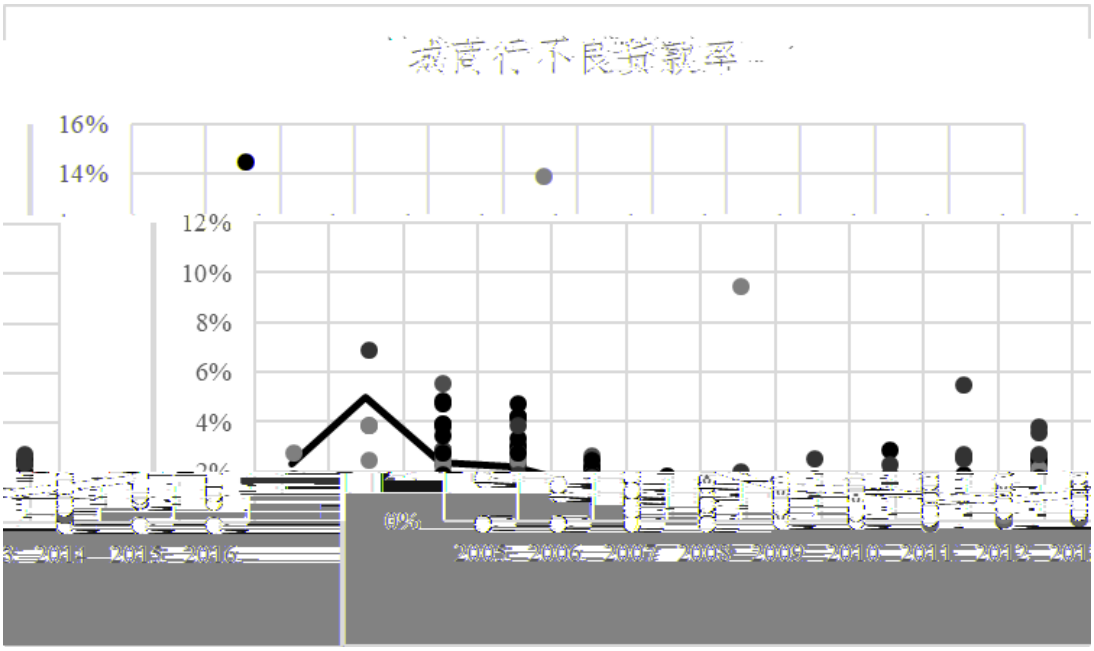
GMM Sargan p

0 05 A B

A

GMM GMM

0 62 0 75



			GMM		GMM	
	1	2	3	4	5	6
NPL(1)	0.423*** 0.0484	0.418*** 0.0477	0.560*** 0.0468	0.1708*** 0.0067	0.5490*** 0.0371	0.3620*** 0.0023
qrbl	1.750 1.264	1.018 1.512	2.078*** 0.6850	-2.0127*** 0.572	2.4126*** 0.6458	-0.3765 0.3647
gr	-12.746** 5.062	-11.906** 5.683	-5.835 4.494	-1.342*** 1.091	-7.530* 4.377	-4.69*** 0.6765
exchangerate	0.603** 0.282	0.3731 0 .304	0.2590 0.1850	0.5339*** 0.0595	0.3953* 0.2050	0.2682*** 0.038

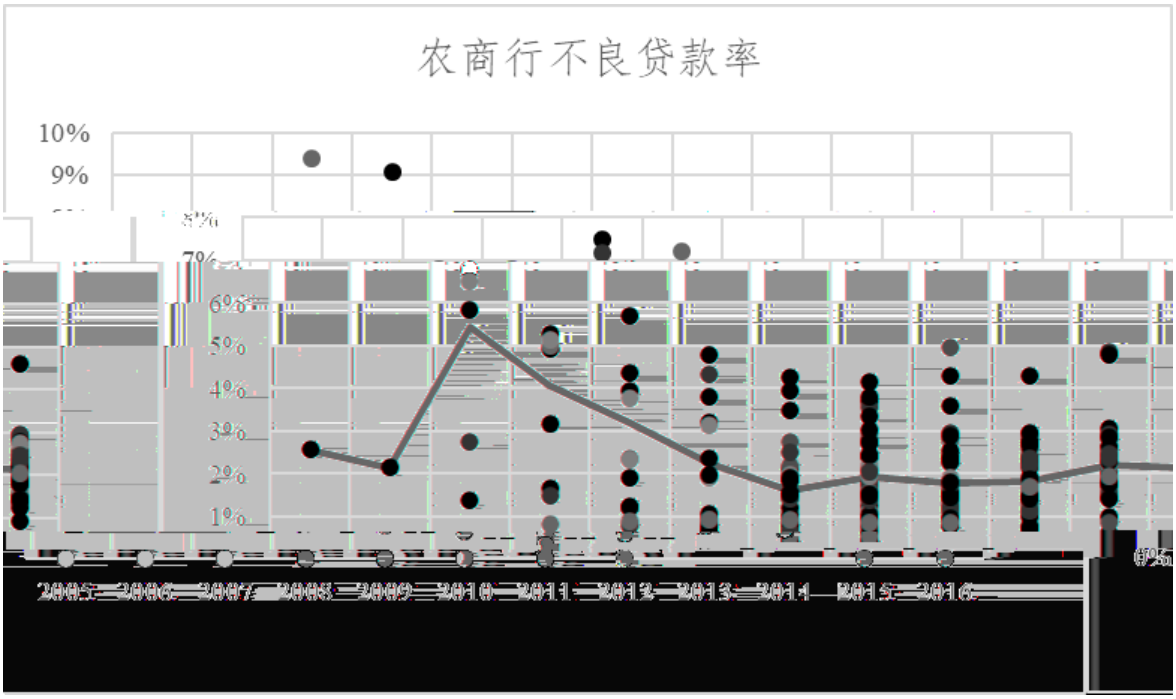
' ln *fj*		-3.964***		-2.8399***		-3.317***
		1.159		0.4863		0.9186
rate		-21.458*		-5.608***		-14.95
		11.559		16.106		1.335
C	-3.906	12.890*	-2.8328	0.1666	-3.888**	0.494**
	2.698	6.673	1.7624	0.6350	1.8435	0.3306
within	0.2610	0.2902				
between	0.9350	0.9310				
			24	27	35	38
Sargan					0.2424	0.3300
p						
A-B AR(1)P-					0.00	0.00
A-B					0.2865	0.3044
AR(2)P-						

0 01 0 05 0 1

38

2 8 4 0

0 001 0 003



			GMM		GMM	
	1	2	3	4	5	6
NPL(1)	0.4146*** 0.0432	0.4064*** 0.0436	0.478*** 0.0289	0.1733*** 0.0390	0.5490*** 0.0371	0.2957*** 0.0151
qrbl	-5.6233*** 1.264	-5.719*** 2.208	-3.777*** 1.2170	-8.824*** 1.135	2.4126*** 0.6458	-6.593*** 0.5304
gr	-24.842*** 4.832	-22.79*** 6.560	-19.883*** 1.555	-12.942*** 2.327	-7.530* 4.377	-17.378*** 1.078
exchangerate	-0.1045 0.222	-0.257 0 .259	-0.2606** 0.1181	-0.1903 0.1359	0.3953* 0.2050	-0.3221*** 0.1049
' ln *fj*		-1.789 1.496		-2.4982*** 0.5703		-0.0858

						0.224
rate		-16.032 10.06		-12.406** 4.850		-11.283*** 3.305
C	9.758*** 2.698	11.246 3.196	8.247*** 1.704	13.891*** 1.391	-3.888** 1.8435	12.161*** 0.6896
within	0.4402	0.4519				
between	0.8529	0.8481				
			22	25	32	35
Sargan p-					0.1695	0.4228
A-B AR(1)P					0.000	0.0293
A-B AR(2)P					0.5945	0.7700

0 01 0 05 0 1

41

2 4 6

17 7 0 1

1 7

GMM

GMM

0 08 3 3

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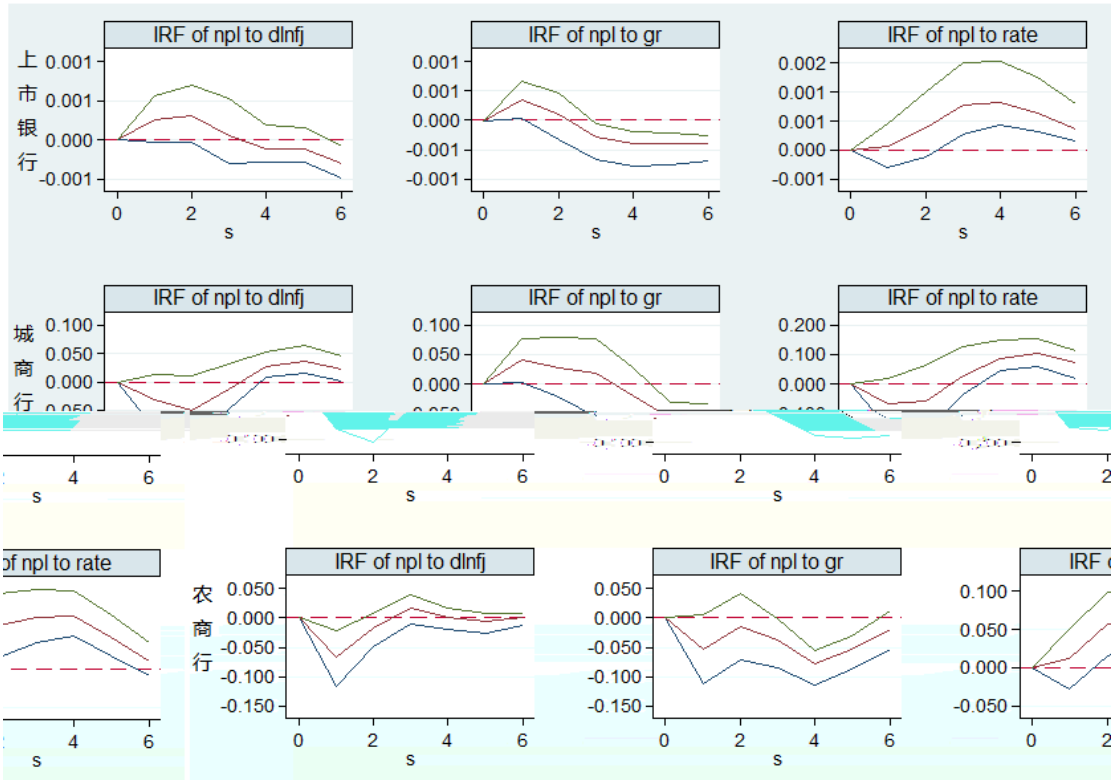

IRF of npl to dlnfj
IRF of npl to gr
IRF of npl to rate
上市银行
城商行
农商行
s

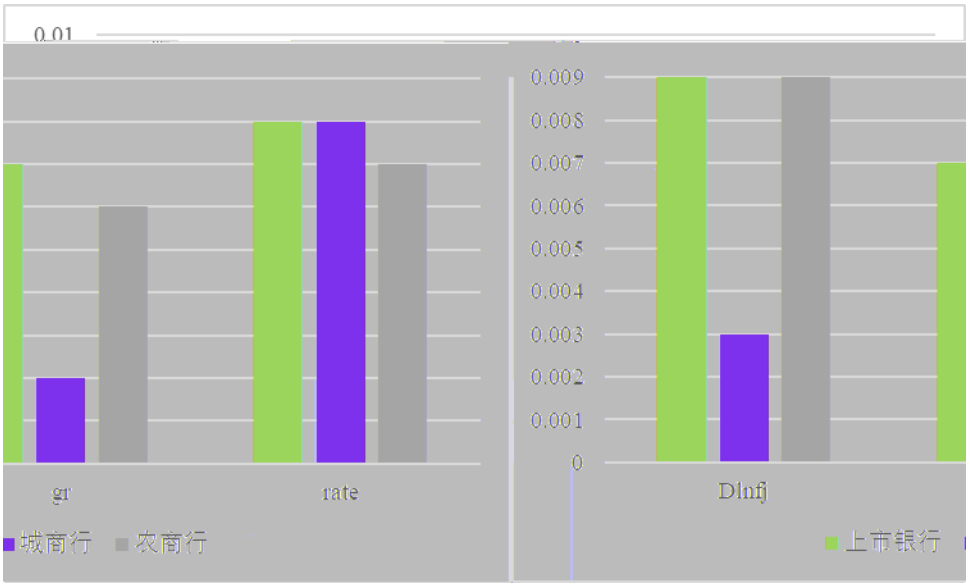
95

VAR

[1]

5

95 10



NPL Dlnfj gr rate

NPL

NPL NPL Dlnfj gr rate

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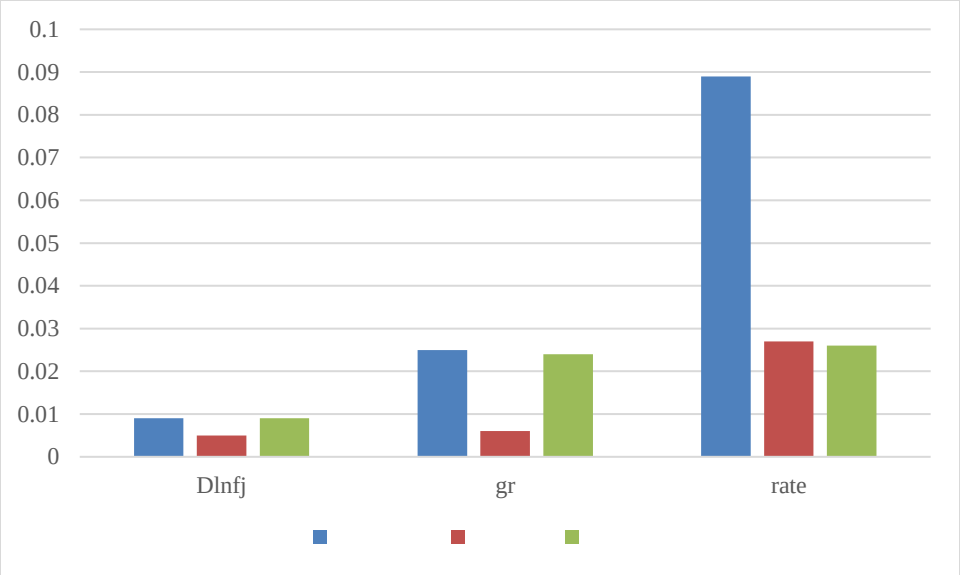
Dlnfj gr rate NPL

Dlnfj gr

rate

6



VAR

2018

VAR

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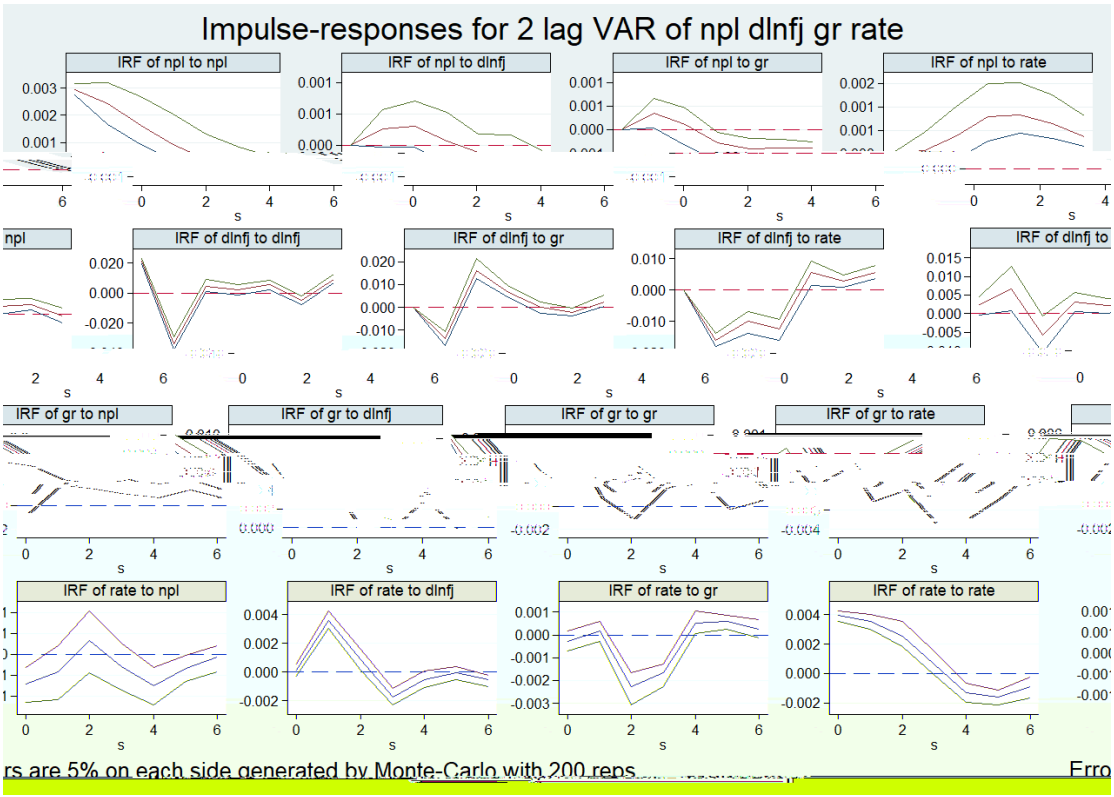
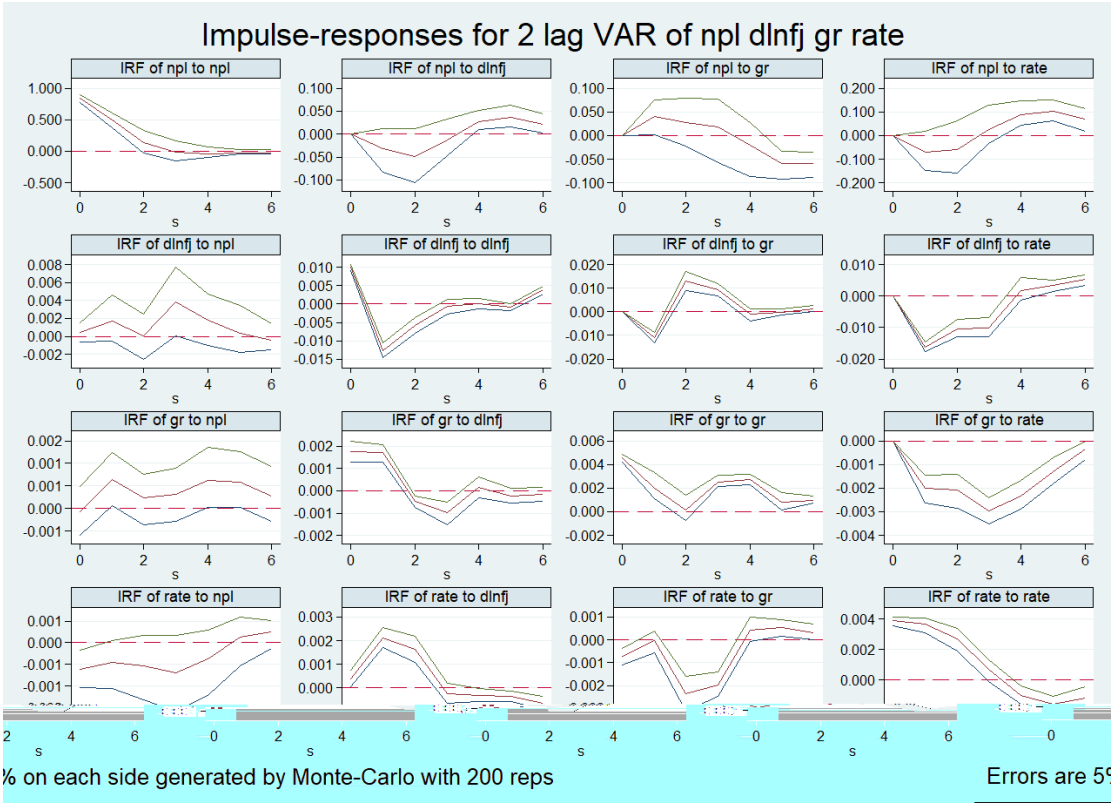
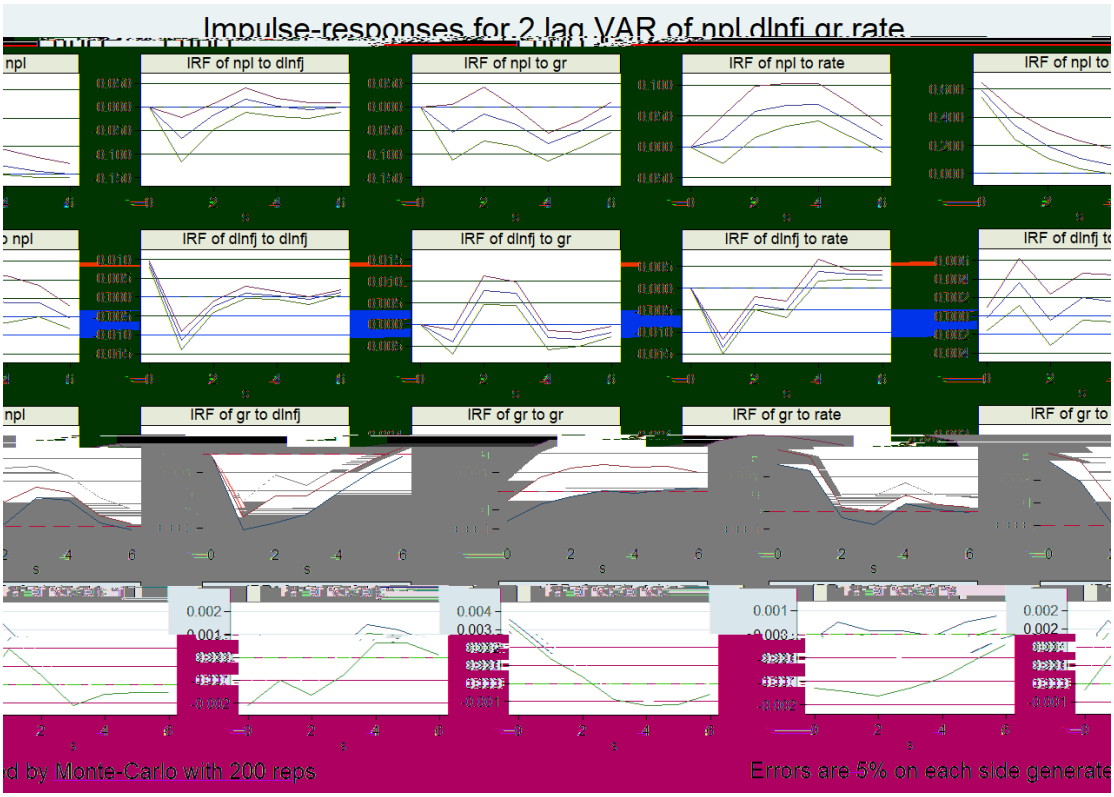
8 VAR


Impulse-responses for 2 lag VAR of npl dlnfj gr rate
IRF of npl to npl
IRF of npl to dlnfj
IRF of npl to gr
IRF of npl to rate
IRF of dlnfj to dlnfj
IRF of dlnfj to gr
IRF of dlnfj to rate
IRF of gr to npl
IRF of gr to dlnfj
IRF of gr to gr
IRF of gr to rate
IRF of rate to npl
IRF of rate to dlnfj
IRF of rate to gr
IRF of rate to rate
s
rs are 5% on each side generated by Monte-Carlo with 200 reps

9 VAR


Impulse-responses for 2 lag VAR of npl dlnfj gr rate
IRF of npl to npl
IRF of npl to dlnfj
IRF of npl to gr
IRF of npl to rate
IRF of dlnfj to npl
IRF of dlnfj to dlnfj
IRF of dlnfj to gr
IRF of dlnfj to rate
IRF of gr to npl
IRF of gr to dlnfj
IRF of gr to gr
IRF of gr to rate
IRF of rate to npl
IRF of rate to dlnfj
IRF of rate to gr
IRF of rate to rate
s
% on each side generated by Monte-Carlo with 200 reps
Errors are 5

10 VAR



Variance decomposition: s = 1,2,3,4,5,6,

Variance-decompositions: percent of variation in the row variable explained by column variable

5

	s	npl	dlnfj	gr	rate	s	npl	dlnfj	gr	rate
npl	1	1.000	0.000	0.000	0.000	4	0.941	0.009	0.011	0.040
dlnfj	1	0.012	0.988	0.000	0.000	4	0.034	0.597	0.182	0.187
gr	1	0.003	0.697	0.300	0.000	4	0.135	0.608	0.204	0.052
rate	1	0.031	0.001	0.004	0.963	4	0.014	0.275	0.133	0.577
npl	2	0.987	0.005	0.008	0.000	5	0.901	0.009	0.019	0.071
dlnfj	2	0.024	0.764	0.090	0.123	5	0.035	0.594	0.178	0.193
gr	2	0.075	0.695	0.213	0.017	5	0.131	0.587	0.214	0.067
rate	2	0.016	0.308	0.002	0.674	5	0.023	0.268	0.131	0.579
npl	3	0.975	0.009	0.007	0.008	6	0.877	0.009	0.025	0.089
dlnfj	3	0.033	0.646	0.180	0.141	6	0.037	0.593	0.177	0.193
gr	3	0.124	0.659	0.197	0.019	6	0.147	0.573	0.209	0.071
rate	3	0.015	0.250	0.097	0.638	6	0.023	0.255	0.130	0.591

6

	s	npl	dlnfj	gr	rate	s	npl	dlnfj	gr	rate
npl	1	1.000	0.000	0.000	0.000	4	0.985	0.004	0.003	0.009
dlnfj	1	0.002	0.998	0.000	0.000	4	0.015	0.253	0.326	0.406
gr	1	0.000	0.132	0.868	0.000	4	0.010	0.130	0.557	0.303
rate	1	0.023	0.009	0.032	0.935	4	0.025	0.133	0.182	0.660
npl	2	0.992	0.001	0.002	0.005	5	0.976	0.004	0.003	0.016
dlnfj	2	0.005	0.406	0.184	0.405	5	0.018	0.251	0.325	0.406
gr	2	0.012	0.173	0.702	0.114	5	0.014	0.106	0.556	0.325
rate	2	0.017	0.136	0.015	0.832	5	0.026	0.132	0.180	0.661
npl	3	0.986	0.003	0.002	0.008	6	0.961	0.005	0.006	0.027
dlnfj	3	0.003	0.308	0.304	0.385	6	0.018	0.249	0.321	0.411
gr	3	0.012	0.159	0.622	0.207	6	0.018	0.102	0.544	0.336
rate	3	0.017	0.145	0.122	0.715	6	0.025	0.127	0.176	0.671

7

	s	npl	dlnfj	gr	rate	s	npl	dlnfj	gr	rate
npl	1	1.000	0.000	0.000	0.000	4	0.967	0.010	0.008	0.015
dlnfj	1	0.001	0.999	0.000	0.000	4	0.029	0.372	0.225	0.374
gr	1	0.004	0.233	0.763	0.000	4	0.032	0.164	0.644	0.160
rate	1	0.032	0.005	0.197	0.767	4	0.054	0.104	0.202	0.640
npl	2	0.984	0.010	0.006	0.000	5	0.948	0.009	0.019	0.024
dlnfj	2	0.031	0.499	0.038	0.432	5	0.032	0.356	0.231	0.382
gr	2	0.007	0.211	0.674	0.108	5	0.040	0.156	0.648	0.157
rate	2	0.036	0.100	0.154	0.710	5	0.055	0.095	0.226	0.623
npl	3	0.978	0.009	0.006	0.007	6	0.940	0.009	0.024	0.026
dlnfj	3	0.026	0.429	0.156	0.388	6	0.034	0.343	0.239	0.384
gr	3	0.019	0.190	0.648	0.142	6	0.051	0.154	0.641	0.154
rate	3	0.046	0.101	0.205	0.648	6	0.052	0.089	0.244	0.615

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