

Online Appendixes to “To Guide or Not to Guide? Quantitative Monetary Policy Tools and Macroeconomic Dynamics in China”

Hongyi Chen,^{a,b} Michael Funke,^{c,d} Ivan Lozev,^e
and Andrew Tsang^c

^aHong Kong Institute for Monetary and Financial Research

^bHong Kong Monetary Authority

^cHamburg University

^dTallinn University of Technology

^eEuropean Commission

Appendix A. Detailed Window Guidance Data Description

This appendix provides a timeline of window guidance in China. As discussed in section 2, we describe the People’s Bank of China’s (PBoC’s) window guidance policy with a five-level indicator. Table A.1 summarizes the period-by-period description of the use of PBoC’s window guidance policy, first mentioned 2001 in its “Quarterly Monetary Policy Report” (QMPR). Our five-level indicator is constructed from this data. Indicator definitions are summarized in table 1 in section 2 of the main text.

Table A.1. Period-by-Period Use of Window Guidance, 2001:Q1–2016:Q2

Date	WG Indicator	Description of Window Guidance/Credit Policy Guidance in “Quarterly Monetary Policy Report”	Page
2001:Q1	0	Report does not mention window guidance or credit policy.	—
2001:Q2	0	Report does not mention window guidance or credit policy.	—
2001:Q3	0	Report does not mention window guidance or credit policy.	—
2001:Q4	0	Since 1998, the macroeconomic-related departments in the government, the PBoC, and commercial banks have attended a monthly meeting on economic and financial trend analysis. It plays an important role in the PBoC’s window guidance for commercial banks.	(Summarized from Chinese version)
2002:Q1	0	Report does not mention window guidance or credit policy.	—
2002:Q2	0	In the second half of 2002, the PBoC continued to use window guidance to guide banks to optimize the credit structure. The PBoC wants banks to increase lending to the agricultural sector and personal loans on housing, vehicles, and education, but strictly restrict consumer lending without specific purpose.	(Summarized from Chinese version)
2002:Q3	0	Report does not mention window guidance or credit policy.	—
2002:Q4	0	(In 2002), the PBoC used credit policy to enhance the economic structure adjustment.	(Summarized from Chinese version)
2003:Q1	-2	(See 2003:Q4 Report.)	—
2003:Q2	-2	(See 2003:Q4 Report.)	—
2003:Q3	-2	After July, the PBoC called three window guidance meetings to analyze the monetary developments of 2003 and issue warnings of the possible systemic risks that could be caused by the excessive credit expansion.	(Summarized from Chinese version)
2003:Q4	-2	Faced with excessive growth in commercial bank lending, particularly to the real estate sector, the PBoC signaled risks in real estate lending in June to standardize practices and strengthen window guidance for commercial bank loans. From early 2003, commercial banks were pushed to take note of rising credit growth and rein in credit growth.	(Summarized from Chinese version)
2004:Q1	-2	The PBoC strengthened window guidance and its warnings about bank lending related to the excessive credit expansion. The PBoC reined in lending to overheated sectors.	(Summarized from Chinese version)
2004:Q2	-2	The PBoC strengthened its control of credit aggregates and window guidance for commercial banks to manage credit growth.	(Summarized from Chinese version)
2004:Q3	-2	The PBoC strengthened window guidance by issuing alerts to commercial banks to prevent excessive credit expansion and encourage commercial banks to manage credit growth.	(Summarized from Chinese version)
2004:Q4	-2	Throughout 2004, the PBoC strengthened window guidance by providing alerts for commercial banks to prevent the excessive credit expansion and guide commercial banks to manage the pace of credit growth and optimize the credit structure.	(Summarized from Chinese version)

(continued)

Table A.1. (Continued)

Date	WG Indicator	Description of Window Guidance/Credit Policy Guidance in “Quarterly Monetary Policy Report”	Page
2005:Q1	-1	The PBoC instructed commercial banks to take a forward-looking approach in response to cyclical changes and industrial trends, ... and enhance capacity to identify and assess risks. Commercial banks were also encouraged to ... be more conscious in optimizing credit structure.	13
2005:Q2	-1	The PBoC ... guided commercial banks in taking a forward-looking approach to respond to changes of economic cycles and industrial development and to improve the credit structure.	13-14
2005:Q3	-1	The PBoC ... provided clear-cut “window guidance” and risk alerts for commercial banks, and guided financial institutions to appropriately control the speed of credit expansion, optimize the credit structure, and improve financial services.	14
2005:Q4	-1	The PBoC strengthened the “window guidance” ... and to promote the rational allocation of credit resource allocation and optimization of national economic structure.	18
2006:Q1	-1	The PBoC ... (enhanced) “window guidance” and risk warning toward commercial banks to guide them to optimize the credit structure and improve financial services.	12
2006:Q2	-2	The PBoC convened three window guidance meetings, requiring commercial banks to be on the alert to the risks associated with an excessive growth of loans, to enhance risk control capacity, to avoid blind credit expansion driven by excessive profit seeking, and to control credit aggregates.	16
2006:Q3	-2	The PBoC (enhanced) communication with financial institutions through window guidance to help them meet the requirements of the state for macroeconomic management, and reasonably control credit growth and adjust the lending structure.	16-17
2006:Q4	-2	The PBoC (strengthened) guidance on credit policy, and (enhanced) communication with financial institutions through window guidance to help ... reasonably control credit growth and adjust the lending structure.	15-16
2007:Q1	-2	To cope with the increasing pressures from credit extension, the PBoC strengthened window guidance and credit policy guidance, required commercial banks ... to reasonably curb credit volume and growth.	18
2007:Q2	-2	The PBoC continued to strengthen the role of window guidance and credit policy guidance to alert commercial banks of the risks arising from an excessively rapid growth of loans and to guide them in controlling the size and pace of credit extension.	11-12
2007:Q3	-2	The PBoC continued to strengthen the role of window and credit policy guidance to convey the purpose of the macro-adjustment measures, alert the commercial banks of the risks arising from an excessively rapid growth of loans.	10-11
2007:Q4	-2	The PBoC continued to strengthen the role of window and credit policy guidance to convey the purpose of the macro-adjustment measures, alert the commercial banks of the risks arising from an excessively rapid growth of loans.	10-11

(continued)

Table A.1. (Continued)

Date	WG Indicator	Description of Window Guidance/Credit Policy Guidance in "Quarterly Monetary Policy Report"	Page
2008:Q1	-2	The PBoC continued to strengthen window and credit policy guidance to call attention to strengthening credit control, to appropriately balance the pace of credit extensions within the year, and to prevent excessive loan fluctuations.	12
2008:Q2	-2	Efforts have been made to guide the commercial banks to strengthen credit control, appropriately balance the pace of credit extensions within the year, and prevent excessive fluctuations of loans.	13
2008:Q3	2	Given the changing overall situation, the PBoC removed the commercial banks' credit ceilings and guided financial institutions to make lending based on effective demand in the real economy and at an appropriately balanced pace.	8-9
2008:Q4	2	In the second half of the year, in accordance with the changed situation, the PBoC timely eliminated the rigid constraints on credit programming of commercial banks, guided financial institutions to reasonably extend loans in accordance with the effective demands of the real economy.	15-16
2009:Q1	2	The financial institutions were encouraged and guided to continue to follow the principle of differentiated treatment to borrowers to support the development of some industries on the basis of balanced growth of credit aggregates.	12
2009:Q2	-2	The PBoC continued to follow the principle of differentiated lending treatment to support certain sectors and industries, guided financial institutions to further optimize the credit structure to support development of the real economy and restructuring and to ward off financial risks. (See also 2009:Q4 Report.)	16
2009:Q3	-2	Financial institutions were guided to control the pace of credit extensions, improve the credit structure, and prevent credit risks.	14
2009:Q4	-2	In April and May of 2009, the PBoC provided window guidance to commercial banks, requiring commercial banks to become "stabilizers" rather than "amplifiers" by reasonably controlling the speed of credit issuance and striking a balance between credit support and risk prevention. Since the middle of 2009, with domestic demand gradually supporting economic growth, the PBoC strengthened window guidance and required financial institutions to strengthen risk assessments of extended credits.	10-11
2010:Q1	-2	The PBoC encouraged financial institutions to properly manage aggregate credit provision, to optimize the credit structure, and to pace credit extensions through enhanced window guidance and credit policy guidance for financial institutions.	14
2010:Q2	-1	The PBoC continued to improve window guidance, . . . encouraged financial institutions to properly manage the pace of credit provisions and improve the credit management system, fully leveraging the role of credit policy to support economic and social development . . . In the meantime, the PBoC strengthened management of lending activities for local government financing platforms, cut back lending to high energy-consuming and polluting industries and industries with an overcapacity.	15

(continued)

Table A.1. (Continued)

Date	WG Indicator	Description of Window Guidance/Credit Policy Guidance in "Quarterly Monetary Policy Report"	Page
2010:Q3	-1	The PBoC continued to improve window guidance of financial institutions. It encouraged financial institutions, in accordance with the differentiated credit policy requirements, to properly adjust the credit structure and manage the pace of credit provisions . . . tightened lending to heavily energy-consuming industries, highly polluting industries, and industries at overcapacity.	16
2010:Q4	-1	The PBoC enhanced window guidance on financial institutions. It improved credit policy guidance and encouraged financial institutions to properly adjust the credit structure and manage the pace of credit provisions so as to provide greater support to economic restructuring and the shift in the development pattern . . . The PBoC cut back lending to high energy-consuming and polluting industries and industries with excessive capacity, and restricted unauthorized lending to local government financing platforms.	8-9
2011:Q1	-1	The PBoC enhanced the coordination of money and credit policy with other policies and strengthened window guidance to encourage financial institutions to improve the credit structure following a differentiated credit policy.	10-11
2011:Q2	-1	The PBoC continued to strengthen and improve window guidance for financial institutions and employed a mix of monetary policy tools, including central bank lending and rediscounts, to encourage financial institutions to improve the structure and pace of credit supply, increase support for economic restructuring and a shift in the development pattern, and expand credit supply to agriculture, rural areas, and farmers, as well as to small and medium-sized enterprises (SMEs) and other weak links in the economy.	12
2011:Q3	-1	Continuing to strengthen and improve window guidance, the PBoC encouraged financial institutions to properly manage the pace of credit supply, improve the credit structure, and prevent credit risks. The PBoC also encouraged financial institutions to enforce a differentiated mortgage policy, strengthen management of lending to local government financing platforms, and rein in lending to heavily energy-consuming and polluting industries as well as to industries with excess capacity, thus supporting the economic restructuring.	10-11
2011:Q4	-1	Continuing to strengthen and improve window guidance and to implement a differentiated credit policy, the PBoC encouraged financial institutions to properly manage the pace of credit supply, to improve the credit structure, and to prevent credit risks to enhance financial services to the real economy and in areas that are key to the people's livelihood.	18
2012:Q1	-1	The PBoC followed a differentiated approach to credit guidance, enhanced examination of lending distribution, promoted better coordination between credit policy and industrial policy, and encouraged improvements in the credit structure . . . The PBoC also reined in lending to heavily energy-consuming and polluting industries as well as industries with excess capacity.	11

(continued)

Table A.1. (Continued)

Date	WG Indicator	Description of Window Guidance/Credit Policy Guidance in “Quarterly Monetary Policy Report”	Page
2012:Q2	-1	<p>The PBoC continued to enhance and improve window guidance of financial institutions. It encouraged better coordination between credit policy and industrial policy, and guided financial institutions to properly manage the credit structure and the lending pace to improve financial services to the real economy and to the people's livelihood by pursuing a differentiated credit policy, thereby accelerating economic restructuring and a shift in the economic development pattern ... The PBoC continued to strictly implement the differentiated mortgage policies ... and to rein in lending to industries with heavy energy consumption, high emissions, and excessive capacity.</p>	11-12
2012:Q3	0	<p>Following a differentiated approach to credit guidance, the PBoC enhanced coordination between credit policy and industrial and regional development policies, and encouraged financial institutions to improve the credit structure and to strengthen financial services to the real economy and the people's livelihood to accelerate economic restructuring and shifts in the economic development pattern ... The PBoC reined in lending to industries with heavy energy consumption, high emissions, and excessive capacity.</p>	13
2012:Q4	0	<p>The PBoC brought into full play of the role of macro credit policies in transforming economic growth pattern and adjusting economic structure, while strengthening adjustments of aggregate money and credit.</p>	15
2013:Q1	0	<p>The PBoC further improved guidance for macro-credit policy, strengthened its coordination with industrial policy, and enhanced the effects of credit-policy guidance so that credit policy will continue to play an active role in promoting sustainable and healthy economic development, harmony, and stability in the society ... Credit support to industries with high energy consumption and high emissions and industries with an overcapacity needs to be controlled.</p>	15
2013:Q2	0	<p>The PBoC continued to employ monetary policy tools, macroprudential tools, and credit policies to guide structural improvements, and enhanced coordination with industrial policies to support the economic restructuring and upgrading and to strengthen the financial sector's capacity to serve the real economy ... Lending to heavily energy-consuming and polluting industries as well as to industries with excess capacity was subject to strict controls.</p>	18-19
2013:Q3	0	<p>The PBoC ... continued to employ monetary policy tools, macro-prudential tools, and credit policies to guide structural improvements, and enhanced coordination with industrial policies to support the economic restructuring and upgrading and to strengthen the financial sector's capacity to serve the real economy ... Strict controls continued to restrict lending to highly polluting, energy-consuming industries, and to those industries with excess capacity.</p>	11-12

(continued)

Table A.1. (Continued)

Date	WG Indicator	Description of Window Guidance/Credit Policy Guidance in “Quarterly Monetary Policy Report”	Page
2013:Q4	0	The PBoC ... continued to use central bank agro-linked loans, central bank discounting, and the reserve requirement ratio to guide credit structural improvements, enhanced coordination between monetary policy and industrial policy and regional development policy, and strengthened the financial sector's capacity to serve the real economy ... Strict controls continued to restrict lending to highly polluting and high energy-consuming industries, and to sectors burdened with overcapacity to resolve the overcapacity problem.	10-11
2014:Q1	0	The PBoC ... continued to use central bank loans and discounts and the reserve requirement ratio to guide credit structural improvements, enhance coordination between monetary and credit policy and industrial policy and regional development policy, and strengthen the financial sector's capacity to serve the real economy ... Lending to heavy energy-consuming, highly polluting industries, and those burdened with overcapacity was strictly controlled.	9-10
2014:Q2	0	The PBoC continued to use monetary policy, macroprudential management policy, and credit policy to send signals and guide structural adjustments, strengthened the coordination of credit policy and industrial policy, and guided the optimization of the credit structure of financial institutions ... Lending to heavy energy-consuming, highly polluting industries and those burdened with overcapacity was strictly controlled.	15
2014:Q3	1	The PBoC continued to use monetary policy, macroprudential management policy, and credit policy to send signals and guide structural adjustments, strengthened the coordination of credit policy and industrial policy, conducted assessments of credit policy guidance, and encouraged banking financial institutions to make innovations in terms of organizations, mechanisms, products, and service models and to optimize the credit structure ... A differentiated approach was adopted toward profit-making enterprises in industries with excess capacity.	19-20
2014:Q4	1	The PBoC continued to use monetary policy, macroprudential management, and credit policy to send signals and to guide structural adjustments, strengthened the coordination of credit policy and industrial policy, further improved assessments of the effects of credit policy guidance, and guided financial institutions to optimize their credit structure ... As for industries with excess capacity, in line with the principle of “differentiated treatment and no one-size-fits-all approach,” the PBoC urged financial institutions to strengthen and improve credit management by way of absorbing, relocating, consolidating, and eliminating excess capacity.	13-14

(continued)

Table A.1. (Continued)

Date	WG Indicator	Description of Window Guidance/Credit Policy Guidance in “Quarterly Monetary Policy Report”	Page
2015:Q1	1	Financial institutions were guided to mobilize the stock of credit assets, optimize the structure of new loans, and support structural adjustments and upgrading . . . With respect to financial services for industries with excess capacity, in line with the principle of “differentiated treatment and no one-size-fits-all approach,” the PBoC urged financial institutions to strengthen and improve credit management by way of absorbing, relocating, consolidating, and eliminating excess capacity.	22
2015:Q2	1	Financial institutions were guided to properly handle new loans, mobilize the stock of credit assets, innovate their organizational structures, collaterals, and product and service modes, and to provide more credit and loans to important areas and to weak links in the economy . . . With respect to financial services for industries with excess capacity, in line with the principle of “differentiated treatment and no one-size-fits-all approach,” the PBoC urged financial institutions to strengthen and improve credit management by way of absorbing, relocating, consolidating, and eliminating excess capacity.	20
2015:Q3	1	Financial institutions were guided to make good use of new loans, mobilize the stock of credit assets, make innovations in their organizational structure, collaterals, and product and service modes, and provide more credit to important areas and to weak links in the economy . . . With respect to financial services for industries with excess capacity, in line with the principle of “differentiated treatment and no one-size-fits-all,” the PBoC urged financial institutions to strengthen and improve credit management by absorbing, relocating, consolidating, and eliminating excess capacity.	13–14
2015:Q4	1	The PBC has strengthened the prominent role of window guidance and credit policies and their effects on the credit structure, guiding financial institutions to make better use of new loans and to revitalize the stock of credit assets, exploring innovative organizational structures, eligible collateral, and product and service models, and allocating more credit resources to key areas and weak sectors in support of stabilizing economic growth, adjusting the economic structure, and improving the livelihood of the people.	27
2016:Q1	1	The PBoC has continued to use window guidance to support steady growth, structural adjustments, and improved livelihood. . . window guidance will be used to enhance and improve financial services and to actively support stable growth, structural adjustments, and improvements in performance in the industrial sector. The window guidance will be also used to provide more credit to important areas and to weak links in the economy.	47–48
2016:Q2	1	The PBoC continued to enhance the role of window guidance and credit policies in signaling and guiding structural adjustments. It explored a positive role of monetary policies in structural adjustment, industrial transformation and upgrading by enhancing support to key areas and the main weak links in the economy.	14

Appendix B. Data Description

B.1 Output Gap

The industrial-production-based output gap is the log-difference between the actual production and the trend production. Until recent years, both output gap series based on gross domestic product (GDP) and industrial production showed a similar development. Given the fact that the industrial production index is available monthly, the industrial-production-based output gap could provide the more updated information on the recent slowdown in China's production. Data for industrial production are the series of real value-added of industrial production index, constructed by using series of the month-on-month changes and year-on-year changes released by the National Bureaus of Statistics (NBS) and seasonally adjusted by applying the X-12 method. All seasonal adjustments for variables here use the X-12 method. The trend production is estimated by Hodrick-Prescott (HP) filter with λ equal to 129,600 (for monthly data), as suggested by Ravn and Uhlig (2002).

B.2 CPI

Year-on-year changes in CPI released by the NBS.

B.3 Loans

The loans variable is proxied by the loans-to-GDP ratio. The loans-to-GDP ratio is the seasonally adjusted level of total loans divided by the seasonally adjusted quarterly nominal GDP, which the source for the loan data is the People's Bank of China (PBoC). In the PBoC's definition, the increase of the total loans is also known as "new loans" while the negative figures for "new loans" represent the decrease in the total loans.

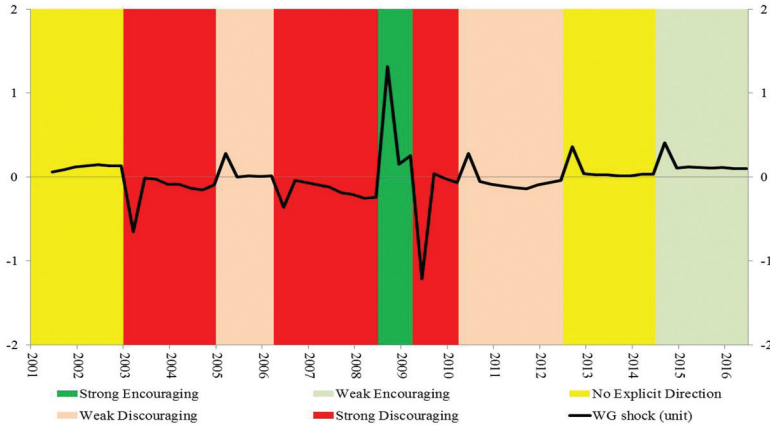
B.4 GDP

The NBS is the source for quarterly nominal GDP, while data for quarterly real GDP are constructed using the series of quarterly real GDP (released by the NBS since 2012) and dated back using the NBS-released series of quarterly year-on-year changes in real

GDP. Seasonally adjusted series for both nominal and real GDP are adjusted with the X-12 method.

Appendix C

Figure C.1. Window Guidance Shock $\hat{\epsilon}_t$ and Window Guidance Stance S_t



Sources: Authors' calculations based on information from the PBoC and the NBS.

Appendix D

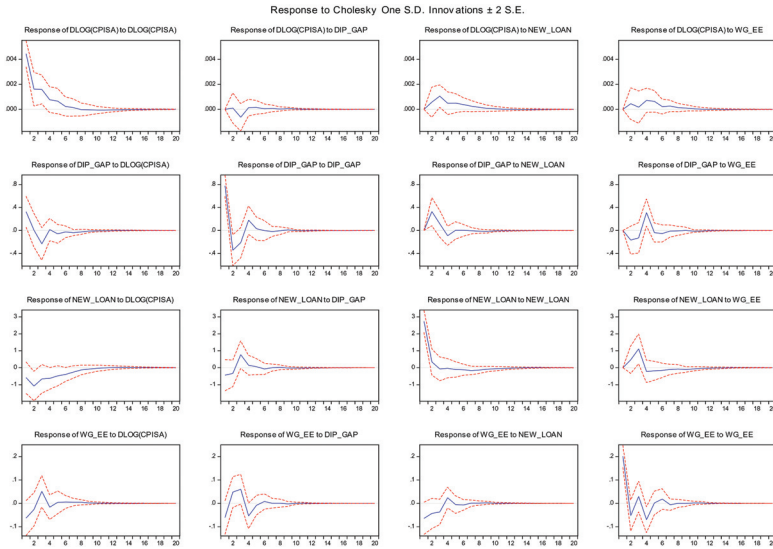
Table D.1. Bivariate Granger Causality Tests for the Window Guidance Shock and the Window Guidance Stance

Causal Relationship	No. of Lags	F(·)	P{F > F(·)}
WG Shocks to WG Stance	6	3.662	0.005
WG Stance to WG Shocks	6	2.298	0.052

Note: The optimal numbers of lags has been chosen according to the Akaike information criteria (AIC).

Appendix E

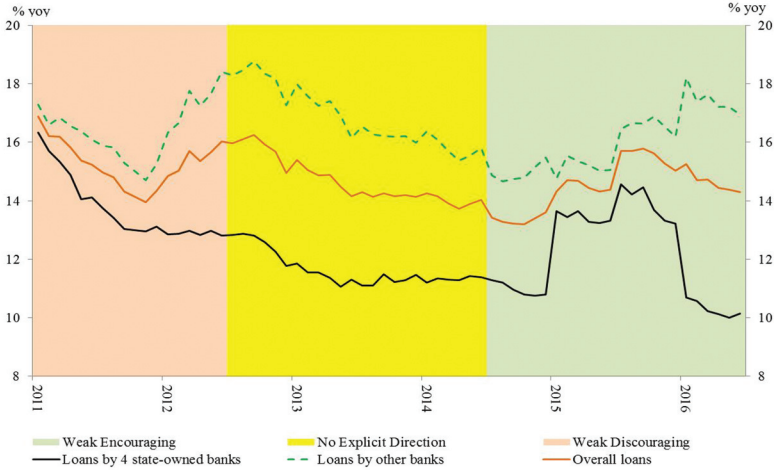
Figure E.1. Window Guidance VAR Impulse Response Functions



Notes: The VAR model contains four quarterly variables, namely DLOG(CPISA), DIP_GAP, NEW_LOAN, and WG_EE. DLOG(CPISA) is the log-difference of CPI, DIP_GAP is the change in output gap based on the industrial production, NEW_LOAN is the ratio of new loans to GDP, and WG_EE is the indicator for window guidance shock created above. The definitions of variables are described in appendix B. Two dummy variables for global financial crisis (2008:Q3–2009:Q1) and China’s stock market turbulence (2015:Q3–2015:Q4) are included as the exogenous variables in the model. The number of lags in the VAR model is two, based on the AIC. The impulse response functions are calculated by using Cholesky decomposition.

Appendix F

Figure F.1. Window Guidance Stance and Loans from Four State-Owned Banks versus Other Banks

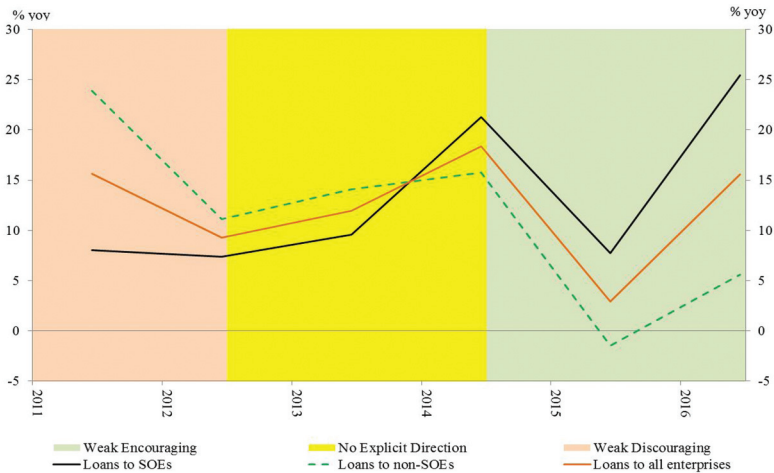


Source: PBoC.

Note: The disaggregated loan data are available since 2011.

Appendix G

Figure G.1. Loans to Enterprises



Source: PBoC.

Note: Loans data by type of enterprises are solely available on an annual basis.

Appendix H

Table H.1. The Chinese Investment Share Including and Excluding Public Infrastructure Investment

Series	GDP by Expenditure Approach	Gross Fixed Capital Formation	Share of Gross Fixed Capital Formation	Fixed-Asset Investment (FAI)	Infrastructure Investment	Share of Infrastructure Investment (% of FAI)	Gross Fixed Capital Formation (Excluding Infrastructure Investment)	Five-Year Moving Average
Unit	RMB 100 Million	RMB 100 Million	% of GDP	RMB 100 Million	RMB 100 Million	(% of FAI)	% of GDP	% of GDP
2003	138,314.7	53,964.4	39.0%	45,811.7	13,577.7	29.6%	27.5%	
2004	162,742.1	65,669.8	40.4%	59,028.2	17,320.5	29.3%	28.5%	
2005	189,190.4	75,809.6	40.1%	75,095.1	21,986.3	29.3%	28.3%	
2006	221,206.5	87,223.3	39.4%	93,368.7	26,620.9	28.5%	28.2%	
2007	271,699.3	105,052.2	38.7%	117,464.5	30,750.9	26.2%	28.5%	28.2%
2008	319,935.8	128,001.9	40.0%	148,738.3	37,594.7	25.3%	29.9%	28.7%
2009	349,883.3	156,734.5	44.8%	193,920.4	53,282.4	27.5%	32.5%	29.5%
2010	410,708.3	185,827.3	45.2%	243,797.8	62,996.3	25.8%	33.6%	30.5%
2011	486,037.8	219,670.9	45.2%	302,396.1	64,508.7	21.3%	35.6%	32.0%
2012	540,988.9	244,600.7	45.2%	364,854.2	74,005.3	20.3%	36.0%	33.5%
2013	596,962.9	270,924.1	45.4%	435,747.4	89,385.3	20.5%	36.1%	34.7%
2014	647,181.7	290,053.1	44.8%	501,264.9	106,780.7	21.3%	35.3%	35.3%
2015	699,109.4	301,503.0	43.1%	551,590.0	124,743.3	22.6%	33.4%	35.3%
2016	745,632.4	318,083.6	42.7%	596,500.8	145,028.2	24.3%	32.3%	34.6%

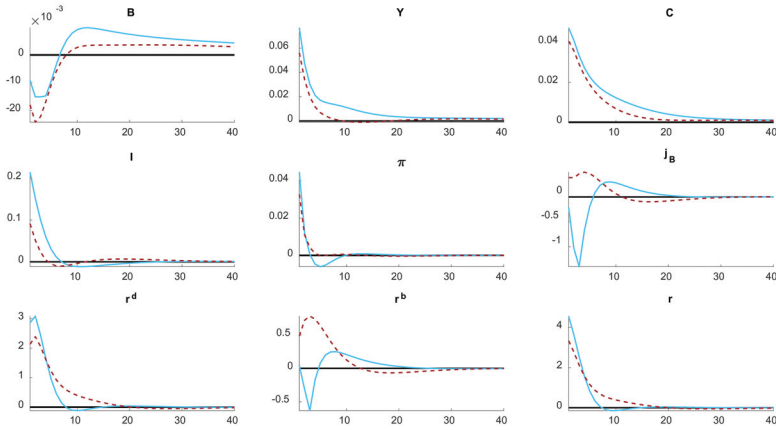
Source: National Bureau of Statistics of China.

Notes: Infrastructure investment includes the fixed-asset investment (FAI) on "Production and Supply of Electricity, Gas and Water," "Transport and Post" (the investment on storage is excluded), and "Management of Water Conservancy, Environment and Public Facilities." Before 2011, the data included the FAI in urban areas only. Since 2011, the data coverage of FAI in urban areas changed into investment in fixed assets (excluding rural households) which included investment in urban areas and investment in rural enterprises (units).

Appendix I. Model-Based Impulse Response Functions

First, we consider a positive demand shock (figure I.1).

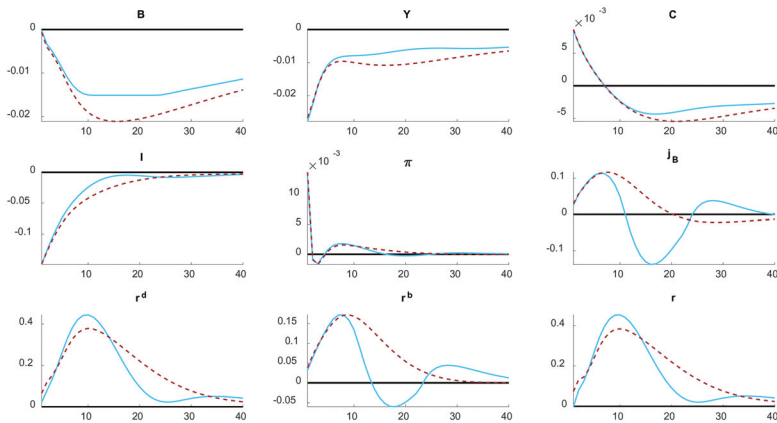
Figure I.1. IRFs from a Positive Demand Shock without (- -) and with (-) Window Guidance



No-Window-Guidance Scenario. This demand shock is implemented as a disturbance in consumption preferences that fades away gradually. Households increasingly value current consumption, temporarily inducing lower saving rates and boosting current consumption. Output and prices react positively on impact. Since monetary policy is countercyclical, official interest rates are raised to stabilize the economy. The negative reaction of banks credit activity has two causes. First, a rise in lending rates following a contractionary monetary policy response drives down credit demand. Second, as savings dry up with the increased preference for current consumption, resources for sustaining credit expansion become scarcer.

Window Guidance Scenario. Banks must lower interest rates to maintain the stock of loans prescribed by the PBoC. Investment is stimulated on impact by the low lending rates and contributes to the expansion of output. By the same token, after an initial spike due to demand pressures, inflation goes below the nonbinding case, i.e., lower lending rates imply lower required capital return

Figure I.2. IRFs from a Negative Investment Shock without (--) and with (—) Window Guidance



and hence lower real marginal costs. Official rates initially increase by more than in the no-window-guidance scenario, in response to higher inflation and output, but eventually fall to reflect the lower marginal costs and inflation. Deposit rates follow closely interest rate developments, stimulating additional household consumption.

In the next analysis step, we analyze the effects of a contractive investment shock. The contractionary investment shock is modeled as an exogenous shock to the price of capital (q_t^K). (See figure I.2.)

No-Window-Guidance Scenario. Investment drops deeply below steady state, which causes a recession. As lower investment depletes part of the productive capital, demand for borrowing also declines and bank credit remains below steady state. Domestic prices increase, reflecting the disrupted supply of physical capital. Monetary policy responds to these price developments with a lag.

Window Guidance Scenario. To move credit in times of low investment demand, banks lower retail interest rates significantly. Bank profitability suffers, but investment receives a boost that helps the recovery. Similarly to the consumptions shock, a positive second-round effect on interest rates is observed—lower lending rates reduce marginal costs, prices, and eventually the policy rate. As a result, household consumption receives a boost.

A provisional conclusion from the impulse response analysis is that window guidance may help deliver additional monetary stimulus in challenging macroeconomic environments.

References

- Ravn, M. O., and H. Uhlig. 2002. "On Adjusting the Hodrick-Prescott Filter for the Frequency of Observations." *Review of Economics and Statistics* 84 (2): 371–80.