

WHAT FACTORS INFLUENCE CHINESE GOVERNMENT BOND YIELDS?

Dr. Tanweer AKRAM (Bermuda Monetary Authority)

Dr. Shahida PERVIN (Waseda University)

October 2025

Disclaimer: The views expressed are solely the responsibility of the authors and should not be interpreted as reflecting the views of the Bermuda Monetary Authority.

DISCLAIMER

The standard disclaimer applies.

Views expressed are only those of these authors.

Institutional affiliations provided merely for identification purposes.

MOTIVATION & QUESTIONS

China (CN) has the second largest bond market.

Outstanding CN government bonds amount to \$3.4 trillion (USD) as 2023.

How to econometrically model government bond yields in China?



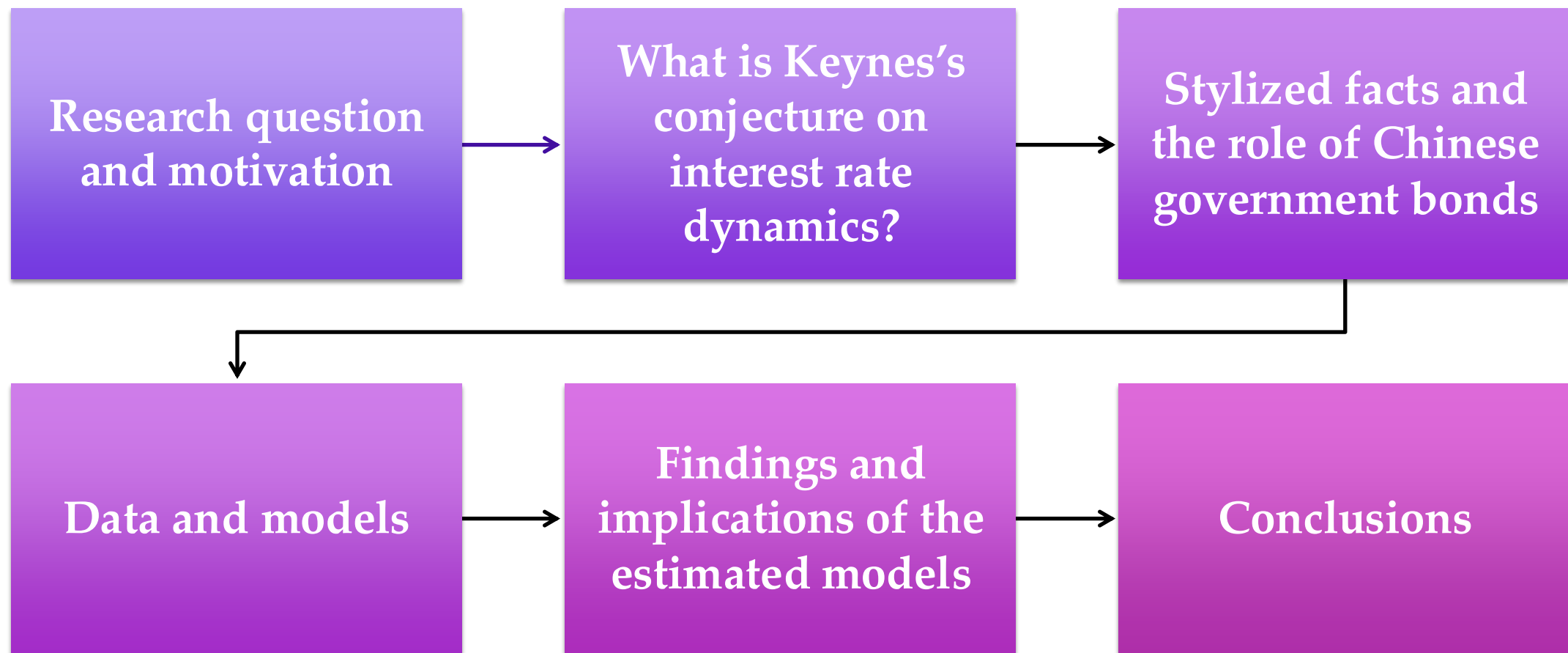
Econometric models of CN government bond yields can provide insights about interest rate dynamics and monetary transmission mechanism in CN.

MOTIVATION & QUESTIONS

John Maynard Keynes's conjecture regarding the relationship between the current short-term interest rate and the long-term interest rate appears to hold for government bond yields in major advanced countries and several emerging markets.

Does Keynes's conjecture on market interest rate dynamics also hold for Chinese government bond (CGB) yields?

HOW THIS PAPER PROCEEDS



A SHORT SUMMARY

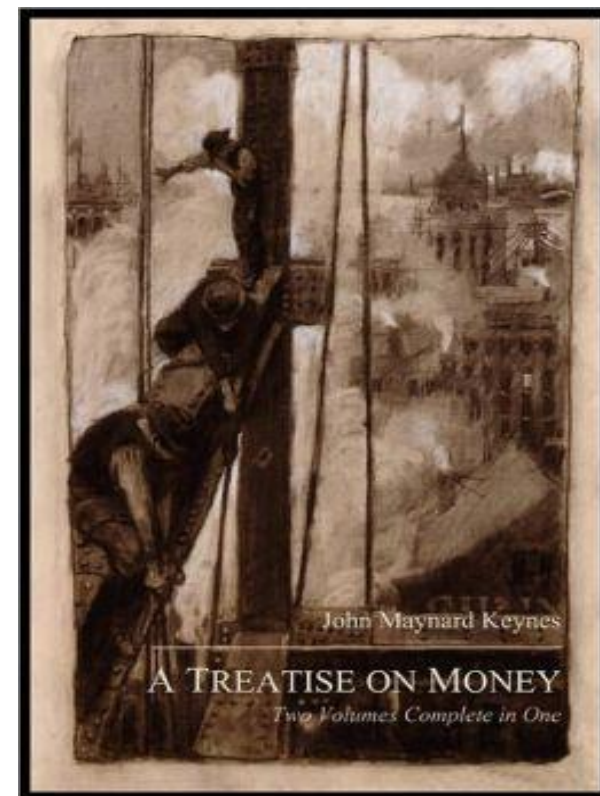
- Keynes argued that a central bank's actions have a decisive influence on long-term government bond yields through the *current* short-term interest rate.
- Empirical studies have shown that Keynes's conjecture holds in major advanced countries & regions (US, EA, JP, CA, GB, AU) and selected emerging markets (CN, MX, BR, IN, CL)
- We examine whether the same empirical patterns also hold for China (CN).
- We econometrically model Chinese government bond (CGB) yields using an autoregressive distributed lag (ARDL) approach.
- We find that Keynes's conjecture holds for CGBs.
- This means that CN policymakers have considerable leeway despite a fixed exchange rate regime.



KEYNES'S CONJECTURE & THE LITERATURE

THE KEYNESIAN VIEW EMPHASIZES THE ROLE OF THE CURRENT SHORT-TERM INTEREST RATE IN SETTING THE LONG-TERM INTEREST RATE

- The central bank targets its policy rate, which drives short-term interest rates. Monetary policy influences the long-term interest rate through the *current* short-term interest rate.
- “The influence of the short-term rate of interest on the long-term [interest] rate is much greater than anyone ... would have expected.” (Keynes 1930, *Treatise on Money*, vol II: p. 353).
- “There is no reason to doubt the ability of a Central Bank to make its short-term rate of interest effective in the market.” (*ToM*, vol II: p. 363).



KEYNES'S PERSPECTIVE WAS INFLUENCED BY RIEFLER'S EMPIRICAL RESEARCH

- ▶ “[T]he surprising fact is not that [long-term] bond yields are relatively stable in comparison to short-term [interest] rates, but that they have reflected fluctuations in short-term [interest] rates so strikingly and to a such a considerable extent.”

—Winfield W. Riefler (1930: p. 123; cited in *ToM, vol II*: pp. 354–55)



SELECTED POST-KEYNESIAN EMPIRICAL RESEARCH ON THE LONG-TERM INTEREST RATE (MOSTLY LT GOV'T BOND YIELDS)

- Atesogulu (2003–4, 2005)
- Chakraborty (2016)
- Cook (2008)
- Deleidi and Levrero (2014)
- Gabrisch (2022)
- Kim (2020, 2021)
- Lavoie (2014)
- Li and Su (2021)
- Marglin (2021)
- Payne (2006-7)
- Pollin (1991, 2008)
- Rahimi (2014)
- Rahimi, Lavoie, and Chu (2016)
- Rahimi, Chu, and Lavoie (2017)
- Vinod, Chakraborty, and Karun (2014)

SELECTED POST-KEYNESIAN EMPIRICAL RESEARCH — OUR RESEARCH

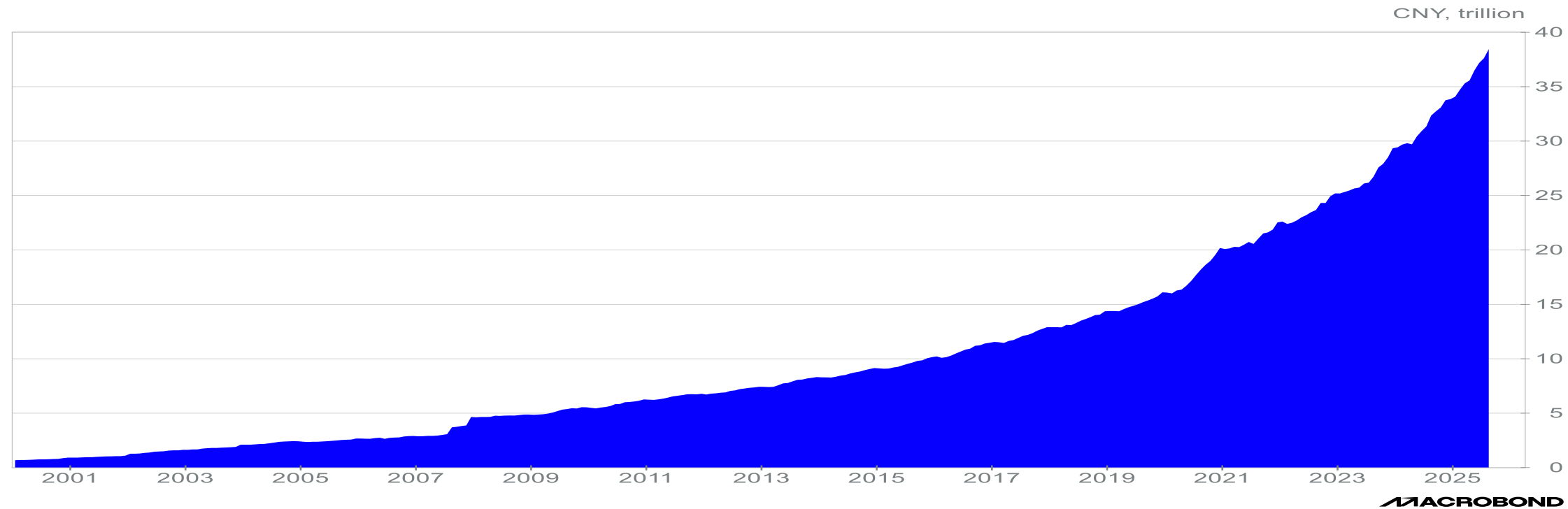
Long-term Government Bond Yields

- Akram and Das (2014, 2016, 2017, 2019, 2020)
- Akram and Li (2017, 2020a, 2020b, 2020c, 2020d, 2024)
- Akram and Uddin (2021, 2022, 2024)
- Akram and Mamun (2024)
- Das and Akram (2020)

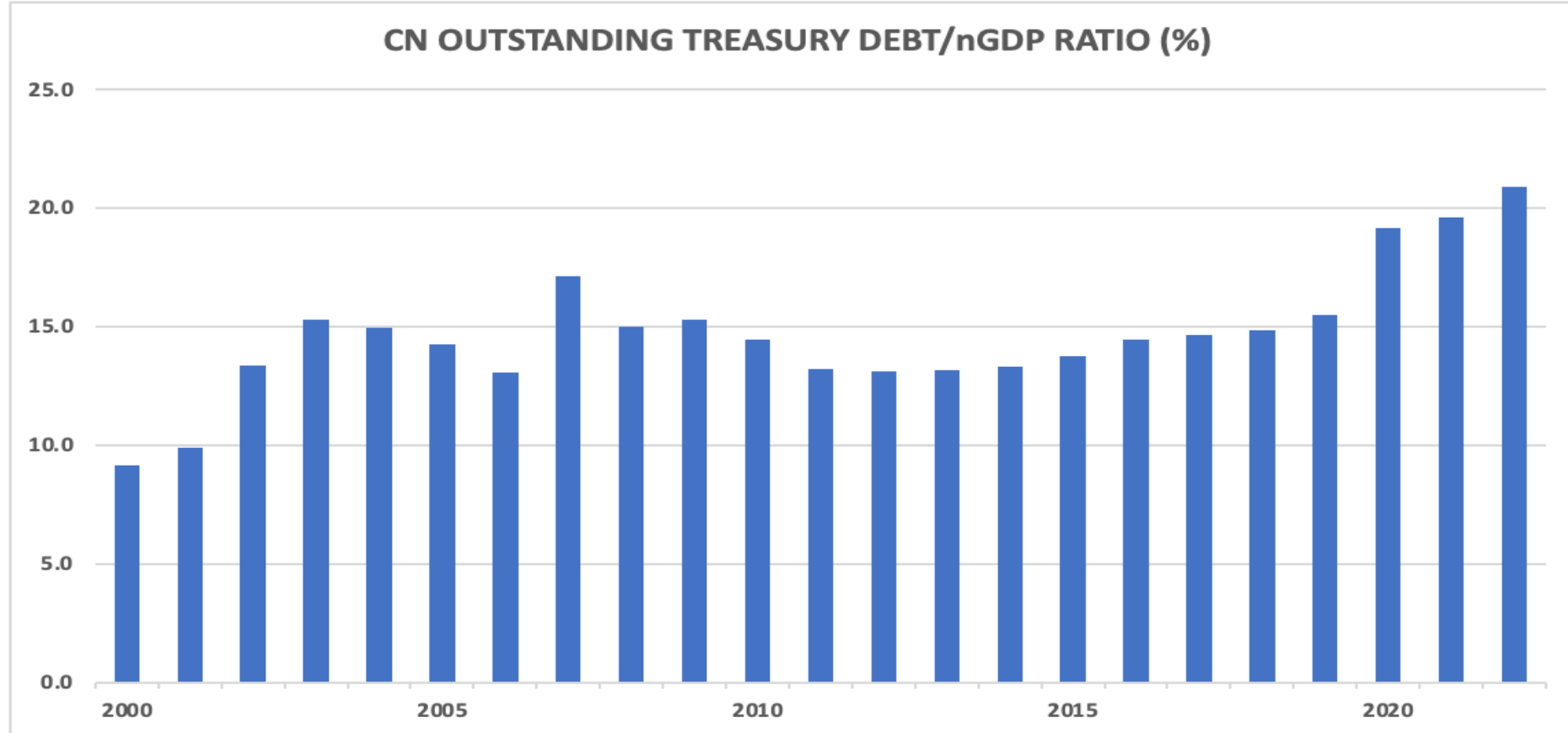
STYLIZED FACTS

OUTSTANDING CN GOV'T BONDS AMOUNT TO ¥38 TRILLION (CNY) ≈ \$3.4 TRILLION (USD)

China, Securities Statistics, ChinaBond, Bond Outstanding, Treasury Bonds, CNY



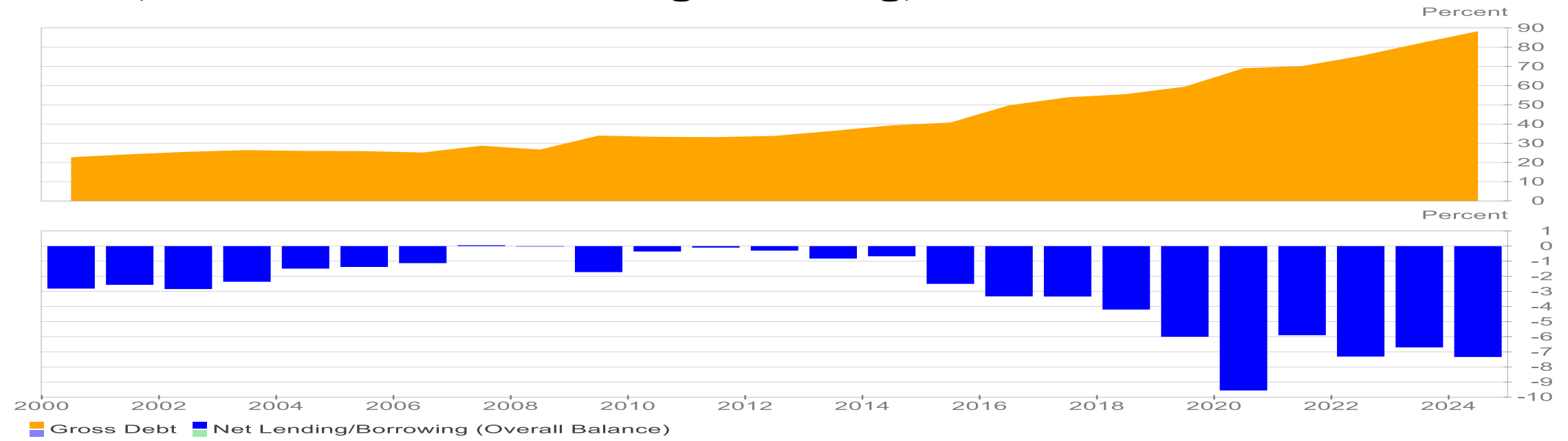
CN CENTRAL GOV'T DEBT IS AROUND 25 PERCENT OF NOMINAL GDP





CN GENERAL GOV'T DEBT & FISCAL BALANCE RATIO

China, Gross Debt and Net Lending/Bororwing, % of nGDP





THE EVOLUTION OF CGB YIELDS

China, Government Benchmarks, Macrobond, Yield



MACROBOND



CGB 10Y YIELDS & SHORT-TERM INTEREST RATES

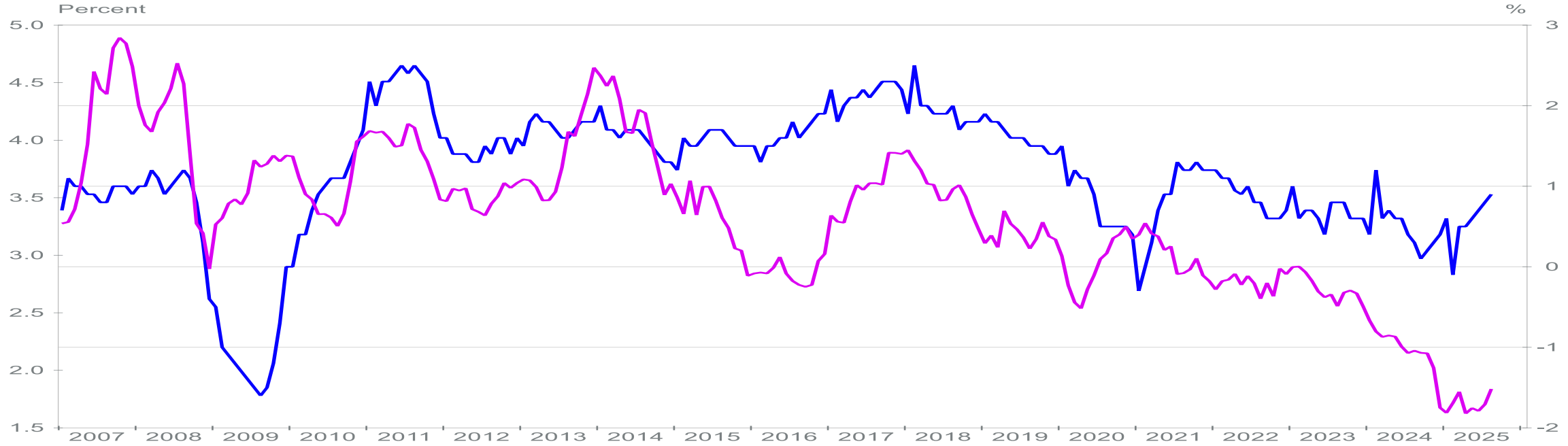
China, Government Benchmarks, CGBs, Yield, %





CGB 10Y YIELDS & CORE CPI INFLATION

China, CGB10 Yield, %, and Core CPI, % ch, y/y



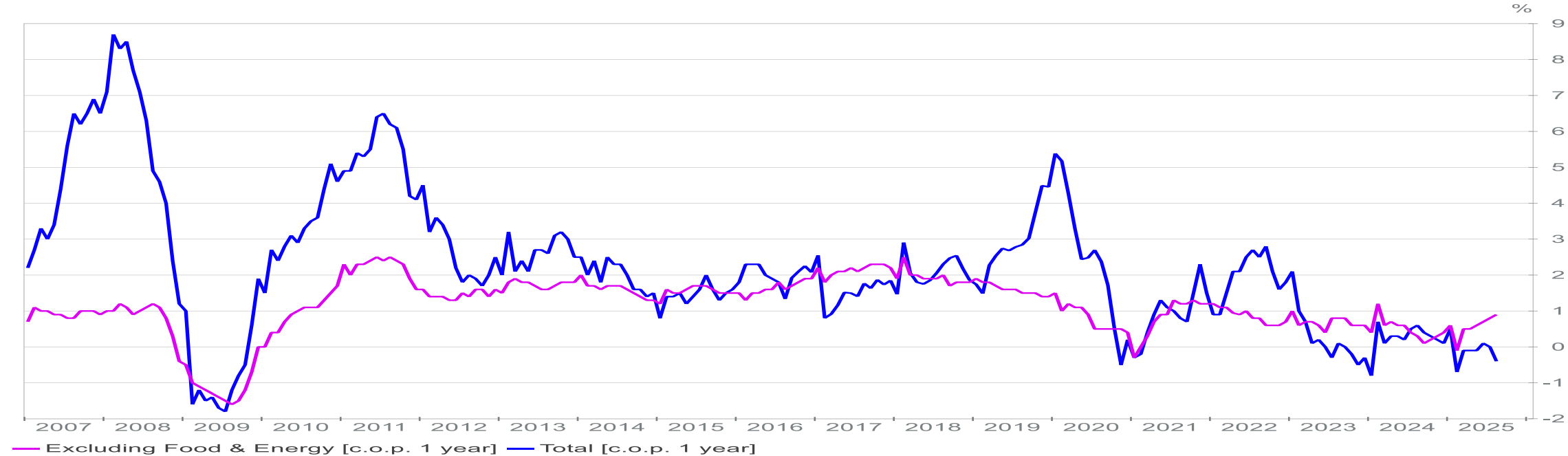
— Government Benchmarks, Macrobond, 10 Year, Yield, lhs
— Consumer Price Index, National, All Areas, Excluding Food & Energy, Index, rhs [c.o.p. 1 year]





CPI & CORE CPI INFLATION

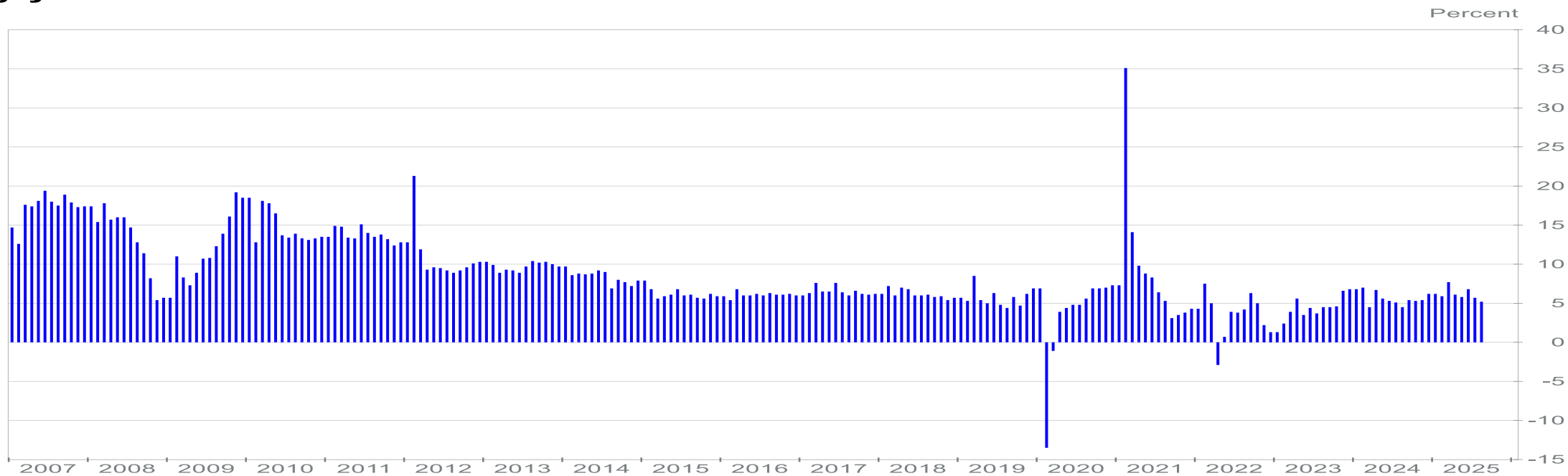
China, Consumer Price Index (CPI) and core CPI, National, All Areas, Index





THE GROWTH OF INDUSTRIAL PRODUCTION

China, Industrial Production, Value Added, Total (Macrobond Calculated), % ch, y/y



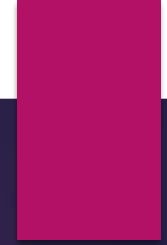
MACROBOND



THE EVOLUTION OF USDCNY (CNY/\$) EXCHANGE RATE

China, FX Spot Rates, CNY per USD, Fixing





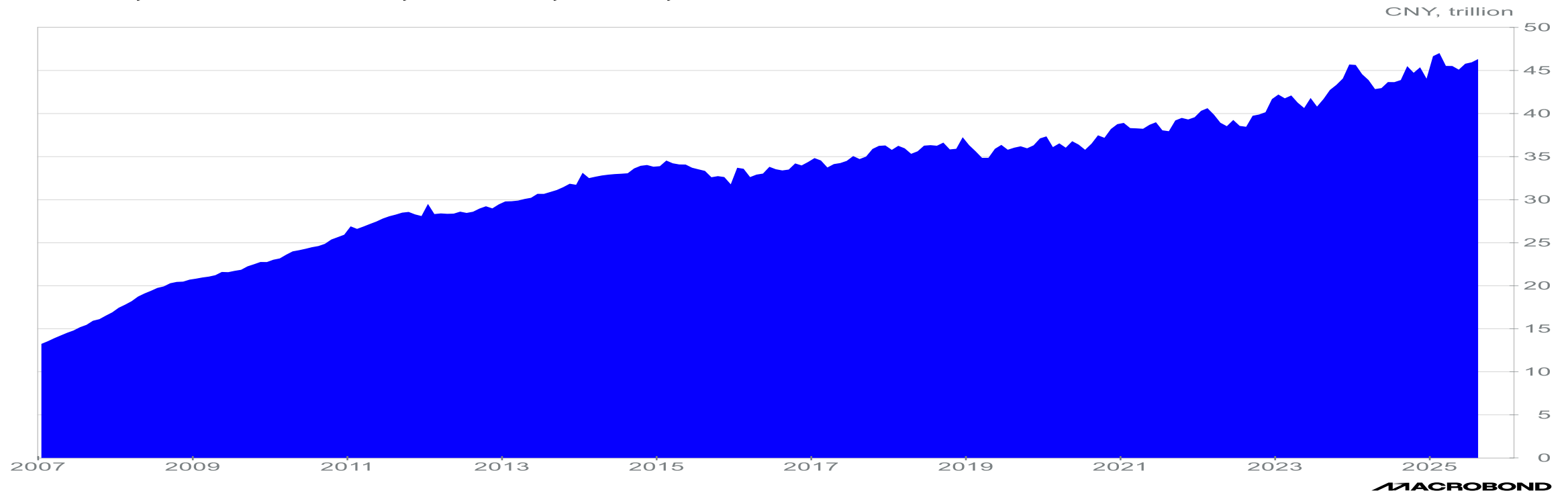
THE EVOLUTION OF TWO KEY EQUITY INDICES IN CHINA

China, Equity Indices, Price Return, Close, CNY



THE BALANCE SHEET OF THE PEOPLE'S BANK OF CHINA (PBOC)

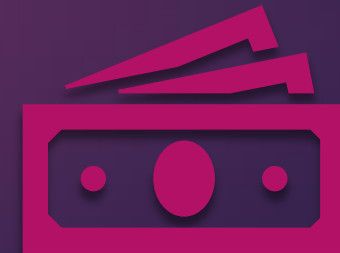
China, Central Bank, Assets, Total, CNY



DATA & MODELS

**MONTHLY
DATA,
JAN 2007 –
AUG 2023**

- Short-term interest rates: **CTB3M, CTB6M**
- Long-term interest rates: **CGB3Y, CGB5Y, CGB7Y, CGB10Y**
- Inflation: **CPI, CCPI**
- Economic activity: **IP**
- Exchange rates (log): **LNUSDCNY, LNEURCNY**
- Stock index (log): **LNSNGHAI, LNSNZN300**
- Central bank balance sheet (log): **LNPBOC**
- 200 observations





MONTHLY DATA,
JAN 2007 – AUG 2023

Levels: Nonstationary
First Differences: Stationary

MODELS: ARDL(p,q)

- $$CGB_i Y_t = \alpha_0 + \sum_{p=1}^3 \alpha_p (CGB_i Y_{t-p}) + \sum_{q=0}^3 \beta_q (CTB3M_{t-q}) + \sum_{j=1}^m \gamma_j X_{j,t} + \varepsilon_t$$
- i is used for 3-, 5-, 7-, and 10-year tenors.
- $$CGB_i Y_t = \alpha_0 + \sum_{p=1}^3 \alpha_p (CGB_i Y_{t-p}) + \sum_{q=0}^3 \beta_q (CTB6M_{t-q}) + \sum_{j=1}^m \gamma_j X_{j,t} + \varepsilon_t$$
- i is used for 3-, 5-, 7-, and 10-year tenors.

FINDINGS

FINDING 1:
ARDL(2,2): The
current 3-month
Treasury bill rate
is positively
associated with
the CGB3Y yield

Variable	Coefficient (SE)	Coefficient (SE)
CGB3Y(-1)	1.08 *** (0.07)	1.09 *** (0.07)
CGB3Y(-2)	-0.32 *** (0.07)	-0.31 *** (0.07)
CTB3M	0.49 *** (0.04)	0.49 *** (0.04)
CTB3M(-1)	-0.45 *** (0.06)	-0.46 *** (0.06)
CTB3M(-2)	0.12 ** (0.05)	0.11 ** (0.05)
CCPI	0.003 (0.01)	0.01 (0.01)
IP	0.01 *** (0.002)	0.004 *** (0.002)
$\Delta(\text{LNUSDCNY})$		-0.22 (0.93)
$\Delta(\text{LNSNGHAI})$		0.33 ** (0.13)
$\Delta(\text{LNPBOC})$		0.50 (0.54)
Constant	0.26 *** (0.05)	0.23 *** (0.05)
Model information		
Included observations	198	198
R-squared	0.96	0.96
Adjusted R-squared	0.96	0.96
S.E. of regression	0.12	0.12
Sum squared resid.	2.65	2.55
Log likelihood	146.27	150.01
F-statistic (prob.)	680.87 (0.00)	487.88 (0.00)
Akaike info criterion	-1.40	-1.40
Durbin-Watson stat.	2.04	2.05
Diagnostic tests		
Breusch-Godfrey serial correlation LM test (null hypothesis: no serial correlation at up to 2 lags)		
F-statistic (prob.)	1.82 (0.17)	2.85 (0.06)
Heteroskedasticity test: Breusch-Pagan-Godfrey (null hypothesis: homoskedasticity)		
F-statistic (prob.)	1.30 (0.25)	0.82 (0.6082)
Bounds test (null hypothesis: no relationship in levels, that is, no cointegration)		
F-statistic	11.00	8.83
10%: I(0) 3.020 I(1) 3.510;		
5%: I(0) 3.620 I(1) 4.160;		
1%: I(0) 4.940 I(1) 5.580		
Ramsey RESET test:		
F-statistic for 2 fitted terms (prob.)	0.81 (0.45)	0.48 (0.62)
Error correction		
COINTEQ* (prob.)	-0.24 (0.00)	-0.21 (0.00)

FINDING 2: The 3-month Treasury bill rate is positively associated with the CGB10Y yield

- Unchanged for additional controls
- The effect for lags of CTB3M on CGB10Y varies with the lags
- Core inflation does not have any statistically significant effect and growth of industrial production has an extremely minute effect
- The effect of the percentage change in the USDCNY exchange rate is negative but insignificant.
- The effect of the percentage changes in the Shanghai stock price index is positive and statistically significant.
- The PBOC's total assets have a positive but statistically insignificant effect

Variable	Coefficient (SE)	Coefficient (SE)
CGB10Y(-1)	1.29*** (0.07)	1.28*** (0.07)
CGB10Y(-2)	-0.42*** (0.07)	-0.39*** (0.07)
CTB3M	0.19*** (0.04)	0.20*** (0.03)
CTB3M(-1)	-0.22*** (0.05)	-0.23*** (0.05)
CTB3M(-2)	0.08*** (0.04)	0.08** (0.03)
CCPI	-0.01 (0.01)	-0.004 (0.01)
IP	0.01*** (0.001)	0.01*** (0.002)
ΔLNUSDCNY		-0.47 (0.83)
ΔLNSNGHAI		0.57*** (0.12)
ΔLNPCBOC		0.67 (0.48)
Constant	0.27*** (0.06)	0.22*** (0.06)
Model information		
Included observations	198	198
R-squared	0.95	0.96
Adjusted R-squared	0.95	0.96
S.E. of regression	0.11	0.10
Sum squared resid.	2.35	2.05
Log likelihood	158.08	171.52
F-statistic (prob.)	552.96 (0.00)	439.06 (0.00)
Akaike info criterion	-1.52	-1.62
Durbin-Watson stat.	2.01	2.05
Diagnostic tests		
Breusch-Godfrey serial correlation LM test (null hypothesis: no serial correlation at up to lags 2)		
F-statistic (prob.)	0.38 (0.68)	1.73 (0.18)
Heteroskedasticity test: Breusch-Pagan-Godfrey (null hypothesis: homoskedasticity)		
F-statistic (prob.)	1.66 (0.12)	1.62 (0.10)
Bounds test (null hypothesis: no relationship in levels)		
F-statistic	7.27	6.16
10%: I(0) 3.020 I(1) 3.510; 5%: I(0) 3.620 I(1) 4.160; 1%: I(0) 4.940 I(1) 5.580		
Ramsey RESET test:		
F-statistic for 2 fitted terms (prob.)	0.10 (0.91)	1.07 (0.35)
Error correction		
COINTEQ* (prob.)	-0.13 (0.00)	-0.11 (0.00)

FINDING 3: Regression results ARDL(p,q): Extended models for CGBJ (with CTB6M)

Variable	CGB3Y (2,2)	CGB5Y (2,2)	CGB7Y (2,2)	CGB10Y (2,2)
	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
CGB_t(-1)	1.00 *** (0.07)	1.06 *** (0.07)	1.21 *** (0.06)	1.23 *** (0.06)
CGB_t(-2)	-0.19* (0.07)	-0.22 *** (0.07)	-0.35 *** (0.06)	-0.32 *** (0.06)
CTB6M	0.63 *** (0.03)	0.46 *** (0.04)	0.33 *** (0.04)	0.25 *** (0.04)
CTB6M(-1)	-0.57 *** (0.06)	-0.46 *** (0.06)	-0.37 *** (0.06)	-0.30 *** (0.05)
CTB6M(-2)	0.08 (0.05)	0.09* (0.05)	0.11 (0.04)	0.09 ** (0.04)
CPI	0.003 (0.004)	0.004 (0.005)	0.005 (0.004)	0.004 (0.004)
IP	0.004 *** (0.001)	0.005 *** (0.002)	0.005 *** (0.002)	0.005 *** (0.002)
ΔLNEURCNY	0.12 *** (0.04)	0.15 *** (0.05)	0.14 *** (0.04)	0.13 *** (0.04)
ΔLNSNZ300	0.38 *** (0.11)	0.55 *** (0.12)	0.55 *** (0.11)	0.59 *** (0.11)
ΔLNPNBOC	-0.28 (0.45)	0.02 (0.51)	-0.09 (0.46)	0.05 (0.46)
Constant	0.15 *** (0.05)	0.19 *** (0.06)	0.23 *** (0.06)	0.18 *** (0.06)
Model information				
Included observations	198	198	198	198
R-squared	0.97	0.96	0.96	0.96
Adjusted R-squared	0.97	0.96	0.96	0.96
S.E. of regression	0.10	0.11	0.10	0.10
Sum squared resid.	1.80	2.28	1.92	1.86
Log likelihood	184.60	161.08	177.94	181.38
F-statistic	699.77	436.13	442.10	487.00
Prob. (F-statistic)	0.00	0.00	0.00	0.00
Mean dependent var.	2.94	3.15	3.35	3.44
S.D. dependent var.	0.59	0.53	0.49	0.50
Akaike info criterion	-1.75	-1.52	-1.69	-1.72
Durbin-Watson stat.	2.149332	2.17	2.14	2.13

FINDING 4: ARDL(2,2): The same message as before from CGB5Y & CTB3M and CGB7Y & CTB3M

Variable (CGB5Y and CTB3M)	Coefficient (SE)	Coefficient (SE)
CGB5Y(-1)	1.11*** (0.07)	1.13*** (0.07)
CGB5Y(-2)	-0.33*** (0.07)	-0.31*** (0.07)
CTB3M	0.37*** (0.04)	0.36*** (0.04)
CTB3M(-1)	-0.34*** (0.06)	-0.35*** (0.06)
CTB3M(-2)	0.11** (0.05)	0.11** (0.04)
CCPI	-0.02 (0.02)	-0.01 (0.02)
IP	0.01*** (0.002)	0.005*** (0.002)
ΔLNUSDCNY		-0.41 (0.97)
ΔLNSNGHAI		0.52*** (0.14)
ΔLNPCBOC		0.80 (0.56)
Constant	0.32*** (0.07)	0.27*** (0.07)
Model information		
Included observations	198	198
R-squared	0.95	0.95
Adjusted R-squared	0.94	0.95
S.E. of regression	0.13	0.12
Sum squared resid.	3.01	2.76
Log likelihood	133.49	142.00
F-statistic (prob.)	472.48 (0.00)	356.20 (0.00)
Akaike info criterion	-1.27	-1.32
Durbin-Watson stat.	2.03	2.07

Variable (CGB7Y and CTB3M)	Coefficient (SE)	Coefficient (SE)
CGB7Y(-1)	1.26*** (0.07)	1.22*** (0.07)
CGB7Y(-2)	-0.44*** (0.07)	-0.44*** (0.06)
CTB3M	0.26*** (0.04)	0.26*** (0.04)
CTB3M(-1)	-0.27*** (0.05)	-0.26*** (0.05)
CTB3M(-2)	0.11*** (0.04)	0.11*** (0.04)
CCPI	-0.01 (0.01)	-0.003 (0.01)
IP	0.01*** (0.002)	0.003 (0.002)
ΔLNUSDCNY		-0.14 (0.22)
ΔLNSNGHAI		0.05 (0.04)
ΔLNPCBOC		0.12** (0.05)
Constant	0.35*** (0.07)	1.77** (0.88)
Model information		
Included observations	198	198
R-squared	0.95	0.95
Adjusted R-squared	0.95	0.95
S.E. of regression	0.11	0.11
Sum squared resid.	2.46	2.37
Log likelihood	153.53	156.97
F-statistic (prob.)	495.54 (0.00)	354.14 (0.00)
Akaike info criterion	-1.47	-1.47
Durbin-Watson stat.	2.01	1.99

CONCLUSION

CONCLUSION

- An increase (decrease) in the *current* short-term interest rate (CTB3M, CTB6M) is associated with an increase (decrease) in CGB yields, after controlling for other variables, including the following: lagged values of CGB yields; lagged values of the short-term interest rate; inflation or core inflation; the growth of industrial production; and the percent changes in the stock price index, the exchange rate, and the PBOC's total assets.
- Two different models of CGB yields from across the CGB yield curve show similar results.
- The PBOC's actions have a marked effect on CGB yields through its policy rates and other monetary policy measures on current short-term interest rates.
- The results show that Keynes's conjecture holds for CN financial markets.
- Chinese policymakers have considerable leeway in fiscal and monetary operations, government deficit financing, and central government debt management, despite a fixed exchange rate regime.