清华大学国家金融研究院

研究报告

Research report

April 30th, 2015

The Great Wall of Debt:

The Cross Section of Chinese Local

Government Credit Spreads

monetary policy and financial stability research center

Abstract

Issued by local government financing vehicles and backed mostly by land sales, chengtou bonds are an important source of financing for Chinese local governments. We identify large heterogeneity in chengtou bond yields, even though they are implicitly guaranteed by the central government. Factors reflecting China's aggregate credit risk and monetary policy are priced in the cross section. Reflecting the nature of their collateral, real estate variables are important drivers of chengtou bond yields, as are other macro fundamentals and liquidity characteristics. We find a significantly positive relation between chengtou bond yields and an index of local government corruption.

1

24

2008 2014 85%

2014 12 4.95 0.82

2014

GDP 2008 130% 200%

LGFV

LGFV

“

”

1994 [1]

1978

1 2008

4 2500

1.2 2.8 Lu and Sun, 2013

Li and Zhou, 2005

2

—— Husain, Mody, and Rogoff, 2005

Levy and Schich, 2010

2015 2 2

3

Butler,

Fauver, and Mortal 2009

Fisman and Wang, 2011, 2013

——

GDP

GDP GDP

0.20%

2015 2 2

1

WIND 1 1 1997 2014

2005 2008

2009

2008 79 258 2008

85% 2014 1704 4.95

2 2 2008

2014 66%

3 chinabond.com

31.0% 24.8%

2015 2 2

21.4% LGFV

4

Case, 2007 2007

Brunnereier, 2009

4

2015 2 2

5

1.1

2 2007 2014

3.5% 6.9%

2009 2.7% 5.4% 2009 6.0

2014 5.3

3 2014 30

2.34 40%

2015 2 2

A AAA A1 A1+

1

Moody’s 2

Fitch Ratings

3 4 5

S&P

2015 2 2

2.1

“ ”

Knez, Litterman, and Scheinkman, 1994

$$Y_{ij}(t) = y_{ij}^{CTB}(t) - y_i^{CGB}(t)$$

2

1

$y_{ij}^{CTB}(t)$ t j i $y_i^{CGB}(t)$

t i

1 20

2 time-to-maturity 10 3

Svensson 1994

Svensson 1994 instantaneous forward rate

f [6]

Nelson Siegel 1987 Svensson 1994

2015 2 2

$$y(m;\theta)=\beta_0+\beta_1\exp\left(-\frac{m}{\tau_1}\right)+\beta_2\frac{m}{\tau_1}\exp\left(-\frac{m}{\tau_1}\right)+\beta_3\frac{m}{\tau_2}\exp\left(-\frac{m}{\tau_2}\right)$$ 2

m $\theta=(\beta_0,\beta_1,\beta_2,\beta_3,\tau_1,\tau_2)$ 2

t t

$\{r_s(t)\}$ s

i “ ” i ——

$$P_i^{CGB}=\sum_{s=1}^{T}\frac{C_i^{CTB}}{(1+r_s(t))^s}+\frac{100}{(1+r_T(t))^T},$$ 3

T C_i^{CTB} $\{r_s(t)\}$ t

P_i^{CGB} y_i^{CGB} y_i^{CGB} i

3 Duffie and Singleton, 1999 i

2007 8 2014 12

28 20,357

2015 2 2

2.2

4 A B

0.79 2005 2014 10

90

10 90 2.95% 0.95%

1.84% 0.87% 4

4 1.98%

4 1 2

2008 2013 3 GDP 4

GDP 4

GDP

2015 2 2

2.3

CDS

FDI

CA

FX

RF

RET A B

CDS FDI CA

FX RF

A B

2015 2 2

RET

2005 1 2014

12

2.4

2005 2014

GDP Growth GDP

Fiscal GDP GDP

Real Estate GDP GDP GDP

Service GDP GDP GDP

Retail GDP GDP GDP

Hotel GDP GDP GDP

Land Cost GDP

Loans to Real Estate GDP

2015 2 2

2.5 _¹>ðSß_´5–7ÿ

Carnegie Endowment 2003

860 GDP 3% 2013 13% [7]

2012

31 753

7

30

2.1 0.4 21.2 13.7

4 50 51

2.6 ?Ð%72¶

68%

30% *t*

www.carnegieendowment.org/files/pb55_pei_china_corruption_final.pdf 2012

“ ”

2015 1 M»2 9® 2ÊM»2 9®

2006 30% 2007 65%

2007 8 60% 70%

2007 8 2014 12

Turnover

Amihud(2002) **Amihud**

$$Amihud_i = \frac{1}{N_t}\sum \frac{|R_{it}|}{Vol_{it}}, \quad (4)$$

R_{it} i t Vol_{it} i t N_t i

High-Low Spread

4 B 0.21

0.74 42.6% Amihud 32.9

2015 2 2

[8]

Pastor and Stambaugh, 2003 Bao, Pan, and Wang, 2011

3

4.1

4.2 4.3 4.4 4.5

3.1

$$\Delta Y_{jt} = \alpha_j + \beta_{j,F}\Delta F_t + \varepsilon_{jt} \quad (5)$$

Y_{jt} j t

5 2007 8 2014

12 89 t

Ang, Bhansali, and Xing(2015)

2015 2 2

3.3 5 $_{j,F}$

5 A

RF

RET 10 90 1.17 1.79

5 B

“ ” “ ” t

“ ” “ ” -

0.24%

3.2

$$Y_{it} = \alpha_0 + \alpha Y_{i,t-1} + \sum_{k=1}^{K} \gamma_k \cdot \beta_{j,F(k)} + \varepsilon_{it} \quad (6)$$

$_{j,F(k)}$ j $F(k)$ $_k$ $F(k)$

k 1,...,K 4.1 6

2015 2 2

4

6 1 6

CDS FDI

CA RF

CDS 10 90

0.5 5 CDS 6 0.35

0.18%—— $_{j,F(k)}$ 10 90

0.18% 1.98% 10%

7 8

7 8 $Y_{j,t-1}$

7 CDS RF

FX

——

FX

8

0.72 CDS

7

2015 2 2

factor loading Daniel and Titman, 1997

CDS FX RF

beta $_{j,F(k)}$

7

$_{j,F(k)}$

3.3

7

Y_{ijt} t j i [9]

S i

j

$_{j,F(k)}$ K=3 CDS FX RF

beta 6

Fang et al., 2015 2003

7

2015 2 2

time-fixed effect $_t$

7 X_{ijt}

$_{j,\mathrm{F(k)}}$

t t

7 A

4 High Middle Low

“ ” High 20.7%

9.9% 3.2%

3.0% GDP GDP

7 A

7 B 1 GDP

GDP GDP 2

3

GDP GDP 4

CDS FX RF beta $_{j,F(k)}$ GDP

4

3.4

3.5

8 1 2

2015 2 2

0.09%

0.05% R^2 20%

3 - 5

beta

8

3.5

Amihud(2002)

9 Amihud

Amihud 0.04% 4

5 - 7

Amihud

2015 2 2

4 - 6

Gervais, Kanieal and

Mingelgrin(2001) Gervais,

Kaniel and Mingelgrin

Miller 1997 Harrison and Kreps

1978 Mei and Xiong

(2009)

AA 52.4%

AAA 32.4% “ ”

7

AAA 1 0 2

Amihud 4 - 6

Amihud 9 7

2015 2 2

4

2008

2014 12 4.95

0.82

2014 2014 10

43 2016 1 1

1

2

2015 2 2

3

10

1. - Asset-backed Securitization in China: Current Issues and Recommendations-----------2015-01

2 -The Great Wall of Debt: The Cross Section of Chinese Local Government Credit Spreads----2015-02

2014 8

2015 2 2

2015 2 2