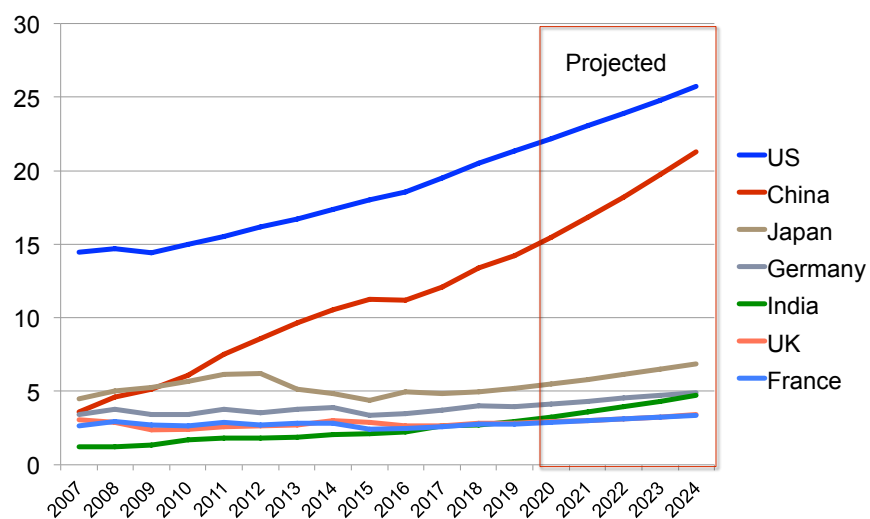


# Debt Instruments and Markets

**Professor Jennifer N. Carpenter**  
**NYU Stern School of Business**

## GDP of Top Seven Economies, Trillion USD 2007-2019



### Global Economic Overview

Country/ Continent	2019 GDP \$T	GDP Growth Rate	Pop. B	GDP per Capita \$K	Pop. per km <sup>2</sup>	Med. Age
US	21	2.8%	0.33	64	36	38
China	14	6.5%	1.40	10	148	37
Japan	5	0.8%	0.13	38	346	49
Germany	4	1.4%	0.08	50	231	48
India	3	7.0%	1.35	2	452	28
UK	3	1.3%	0.07	43	271	41
France	3	1.5%	0.07	43	109	41
Asia	30		4.44	7	144	31
North America	24		0.58	48	20	35
Europe	22		0.74	29	33	42
South America	4		0.42	9	32	31
Africa	2		1.22	2	42	18

### The two largest economies and global growth drivers

Country	2019 GDP \$T	2023 GDP \$T	% of Global Growth
<b>US</b>	<b>21</b>	<b>26</b>	<b>16%</b>
<b>China</b>	<b>14</b>	<b>21</b>	<b>26%</b>
Japan	5	7	6%
Germany	4	5	4%
<b>India</b>	<b>3</b>	<b>5</b>	<b>7%</b>
UK	3	3	2%
France	3	3	2%

### have very different financial systems...

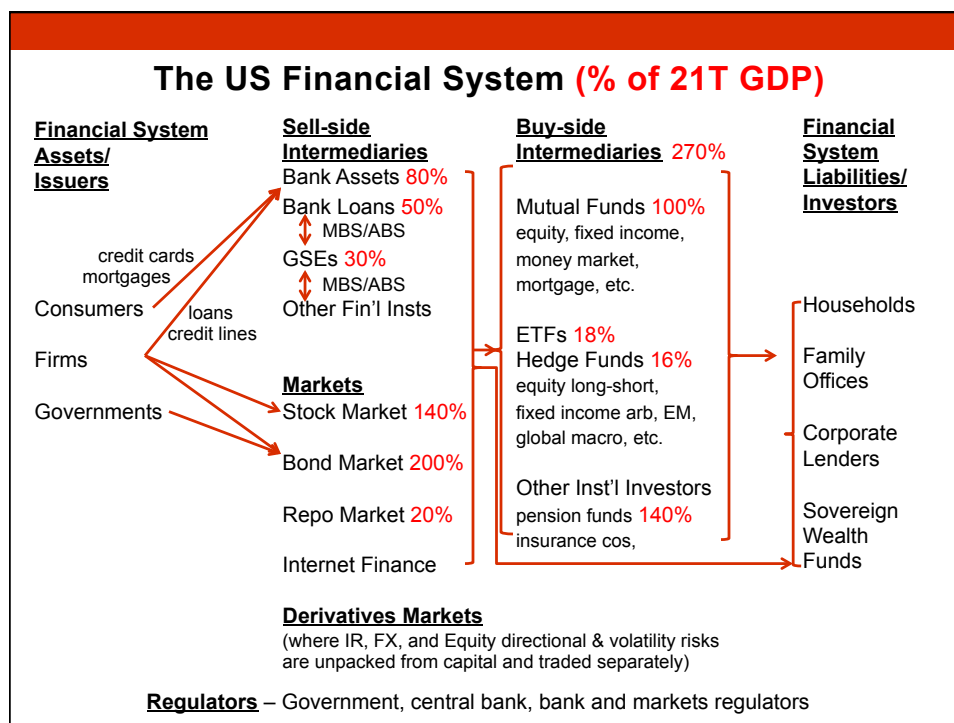
Country	Bank Assets \$T	Bond Mkt \$T	Stock Mkt \$T	Total \$T
<b>US</b>	<b>17</b>	<b>42</b>	<b>31</b>	<b>90</b>
<b>China</b>	<b>39</b>	<b>13</b>	<b>8</b>	<b>60</b>

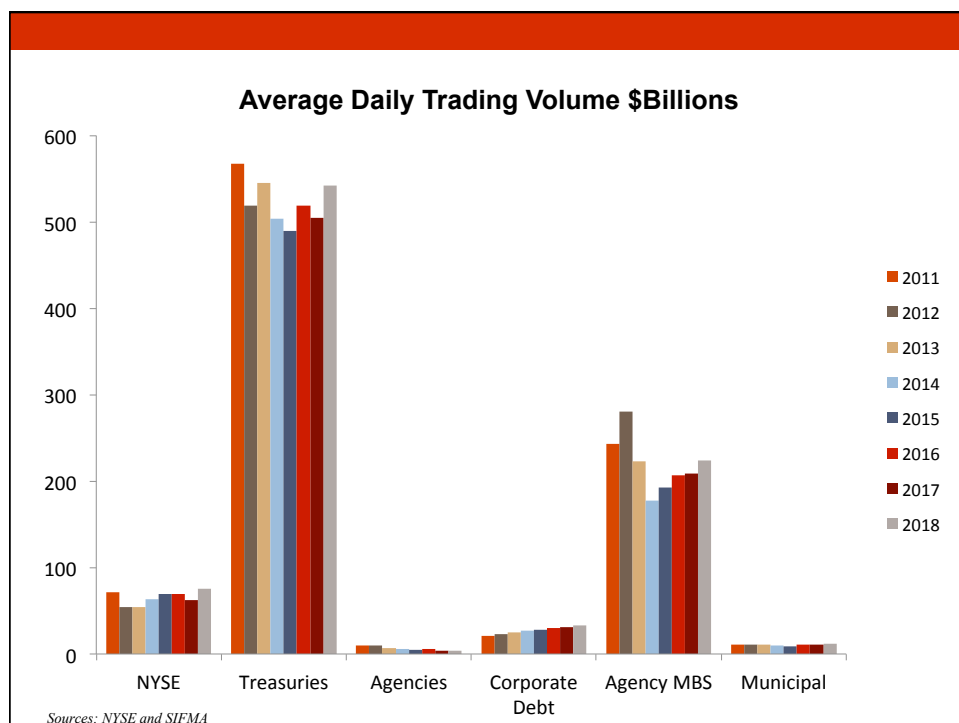
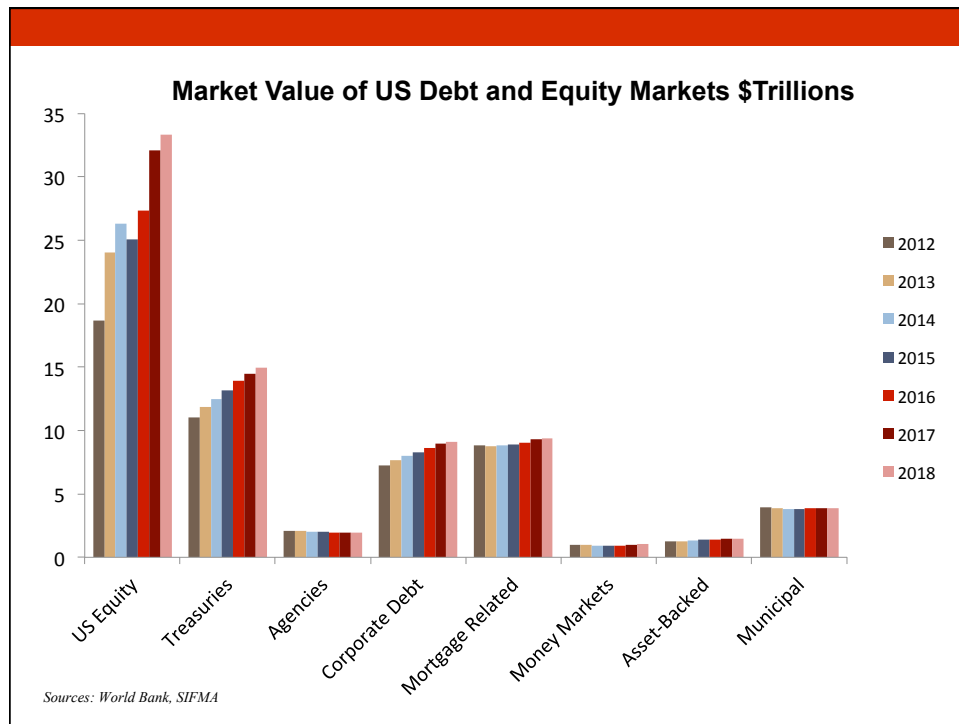
- The US financial system is dominated by its securities markets.
- China's financial system is dominated by its state-owned banks.

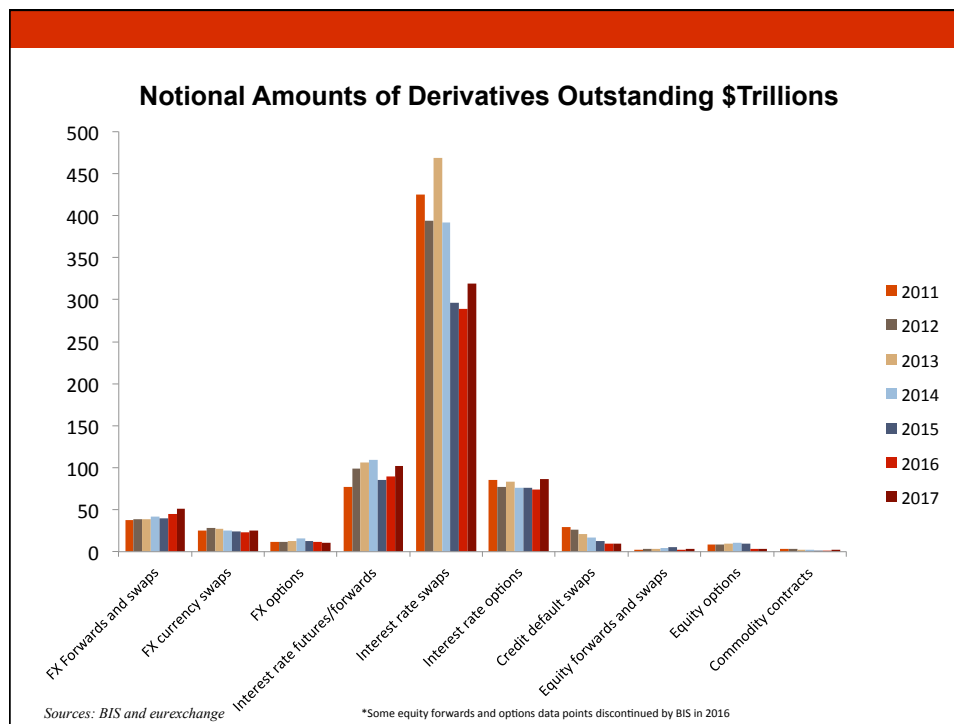
## Overview of Debt Markets in the US and China

### Readings

- Tuckman and Serrat, “An Overview of Global Fixed Income Markets” (US, Europe, and Japan)
- Amstad and He, “Chinese Bond Market and Interbank Market,” in The Handbook of China's Financial System  
[http://www.zhiguohu.com/uploads/1/0/6/9/106923057/handbookchinafinancialsystem\\_ch6\\_bondmarket\\_20181001.pdf](http://www.zhiguohu.com/uploads/1/0/6/9/106923057/handbookchinafinancialsystem_ch6_bondmarket_20181001.pdf)
- Amstad and He, “Underestimated Role of Banks in China's Bond Market”  
<http://www.voxchina.org/show-3-137.html>







## The US Mortgage Market and the Broader Fixed Income Markets

- The massive US fixed-rate mortgage market emerged from regulation dating back to the 1930s Depression-era New Deal.
- This market has helped shape the broader markets for fixed income securities, derivatives, and asset management, which intermediaries depend on to manage and allocate interest rate risk.

### 30-Year Fixed-Rate

#### Mortgage

- Default Risk
- Diversifiable risks
- Duration
- Embedded options
- Capital

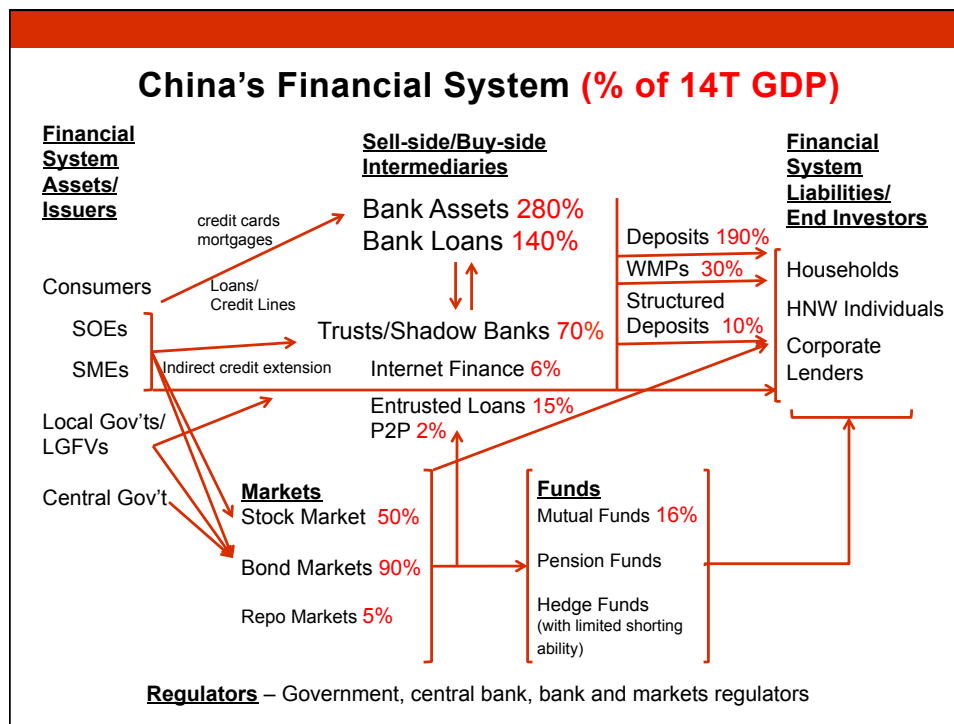
#### Financial System

- FNMA – insures against default, pools risks
- Interest Rate Swaps Market
- Caps & Swaptions Market
- Mortgage/MBS Funds
- Money Market Funds

#### Investors

Households  
&  
Institutional  
Investors

- Understanding the underlying bond math and fixed income option pricing helps clarify how all these markets fit together.



## The Big Four Commercial Banks

- Developed 1979-1984, carved out of parts of the PBoC.
- Partially privatized after 2005, but still majority state-owned.



- ICBC – 69% state-owned



- CCB – 57% state-owned



- ABC – 79% state-owned



- BOC – 64% state-owned

### Four Partner “Asset Management Companies”(AMCs)

- Created after 1997 Asian financial crisis to buy banks' NPLs, strengthen the banking sector, and prepare for China's 2001 entrance to the WTO.
- Purchased 2.4T RMB of loans in exchange for low-coupon bonds.
- Recovery rate on ultimate sale of loans estimated 24-40%.
- Diversified into other business lines over the last decade.
- Directed to re-focus on NPLs in January 2018.



### Three Policy Banks



- Long-term financing for infrastructure and other major development projects (petrochemical engineering, car-manufacturing, electronics)

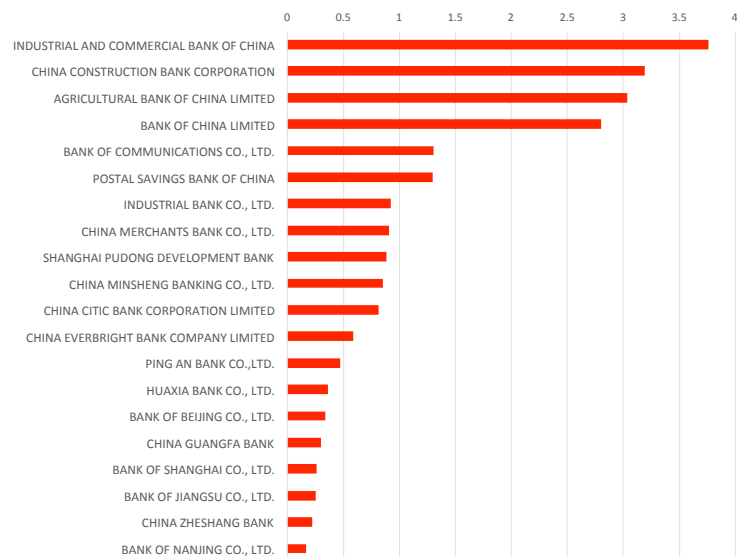


- Agriculture and rural policy related financing



- Financier for exporting and importing companies and creditor for international loans

## Top 20 China Financial Institutions by Total Assets 2018 \$Trillions



Source: WIND

## China – The World's Largest Investor

2017 ADB report finds China is the only developing Asian country that has kept up with investment in power, transport, and sanitation systems.

### Asia's \$26tn infrastructure gap threatens growth, ADB warns

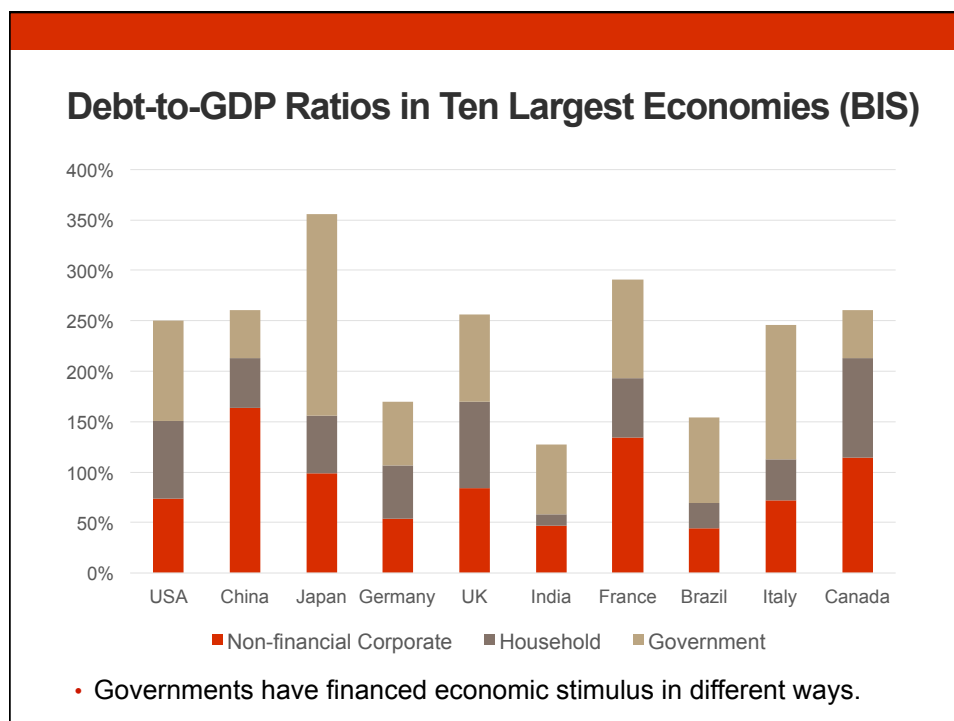
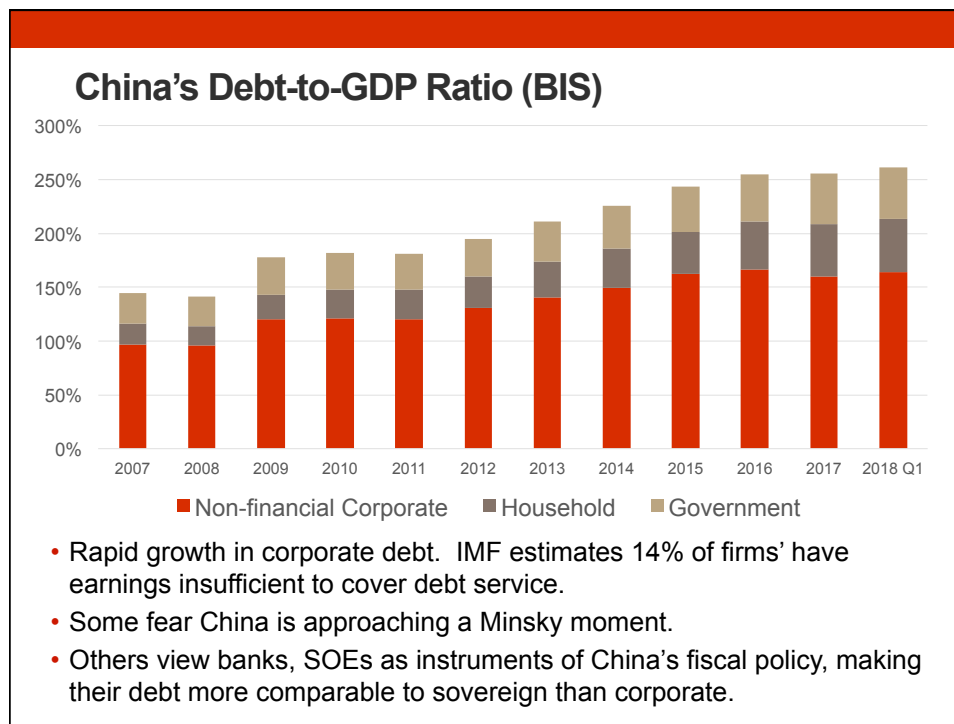
Fast-growing economies urged to double spending on transport, power and sanitation



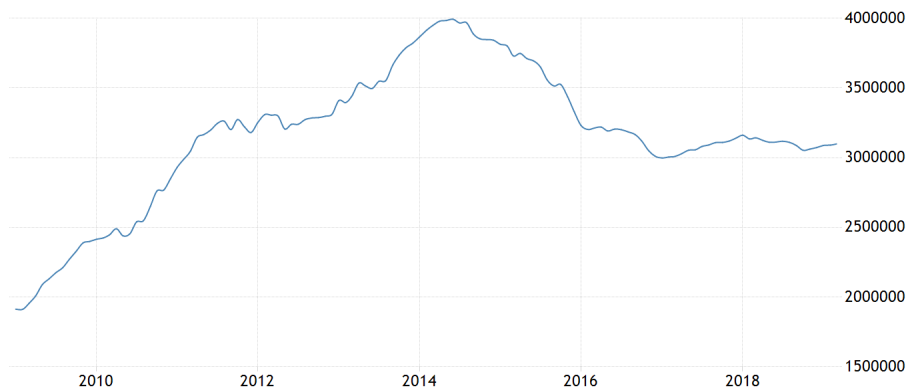
Asia's infrastructure shortfall is most acute outside China, above, which is already spending at more than 90 per cent of the levels it is projected to need. This train in remote Urumqi is running on a 1,776km high-speed line

Source:  
Financial Times





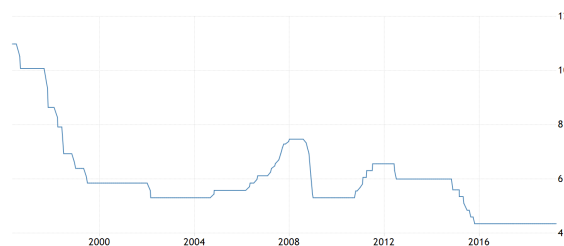
## China Foreign Exchange Reserves



SOURCE: TRADINGECONOMICS.COM | PEOPLE'S BANK OF CHINA

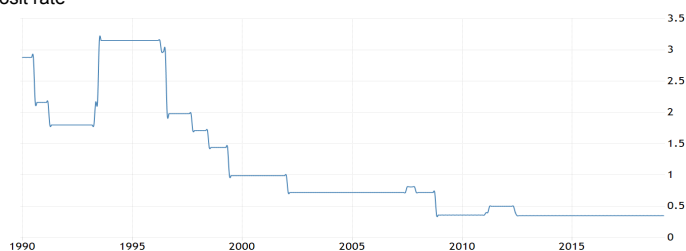
## Administered Lending and Deposit Rates in China

Lending rate

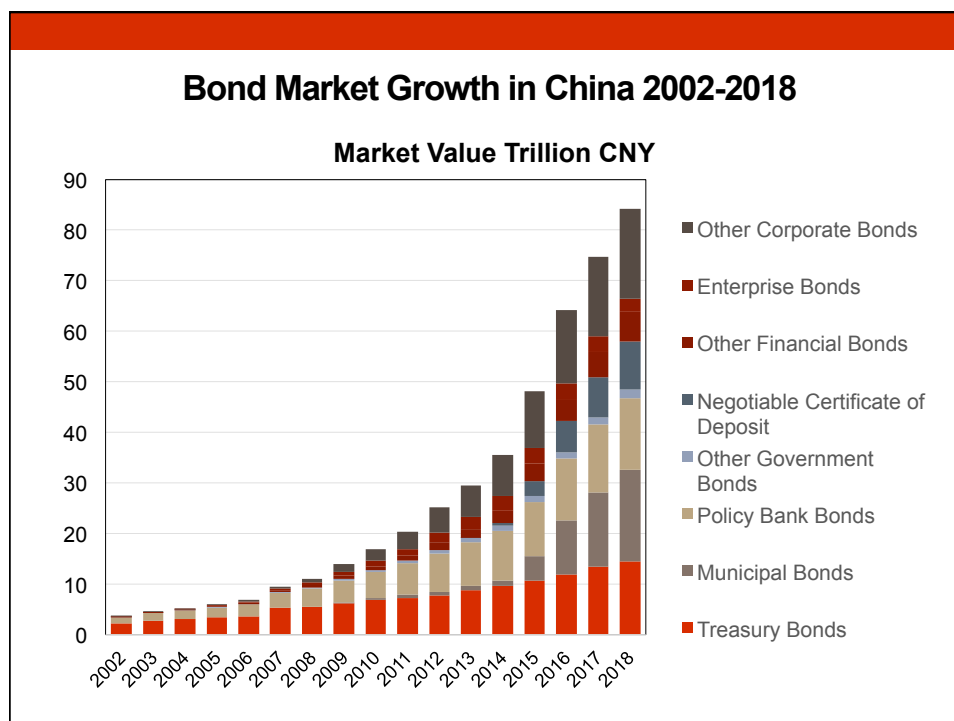
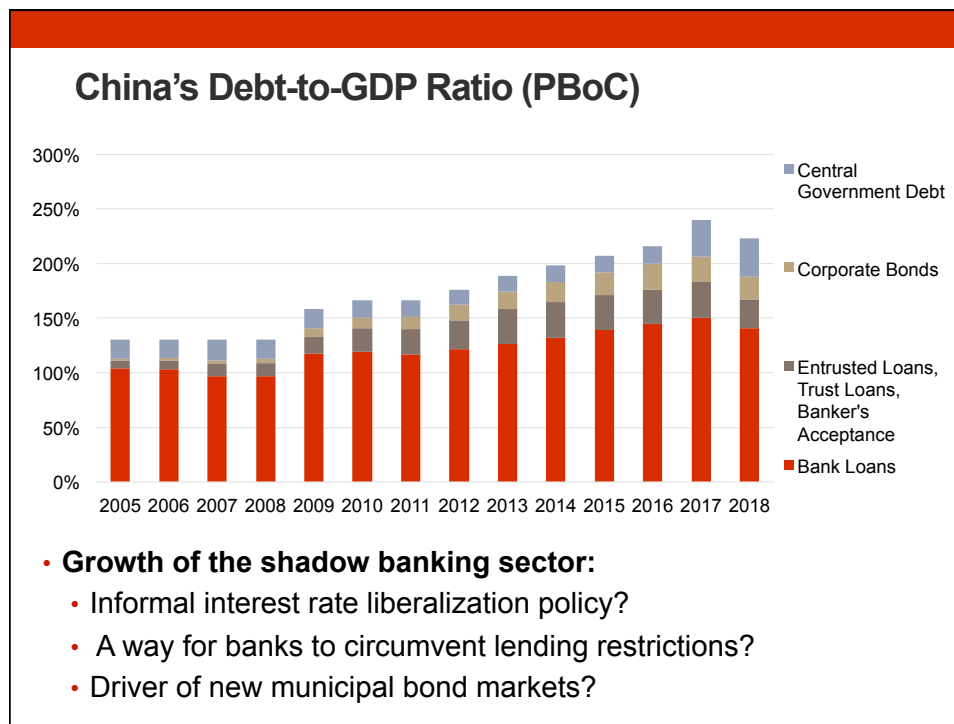


SOURCE: TRADINGECONOMICS.COM | THE PEOPLE'S BANK OF CHINA

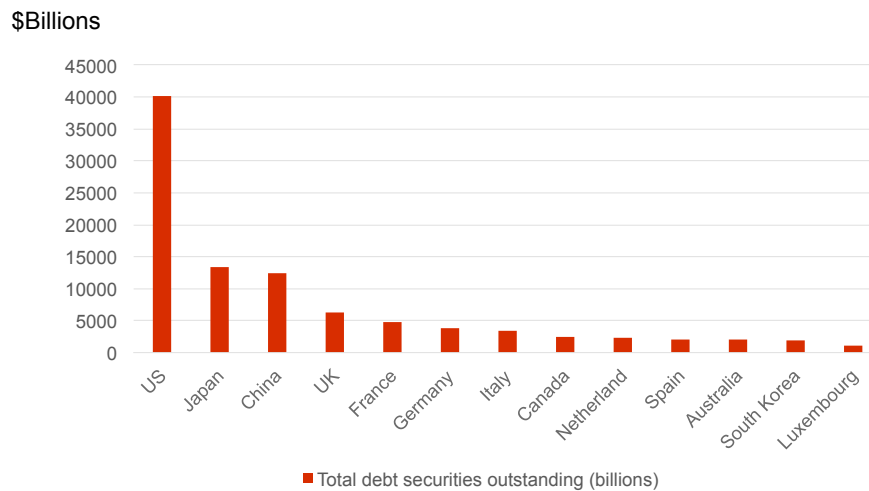
Deposit rate



SOURCE: TRADINGECONOMICS.COM | THE PEOPLE'S BANK OF CHINA

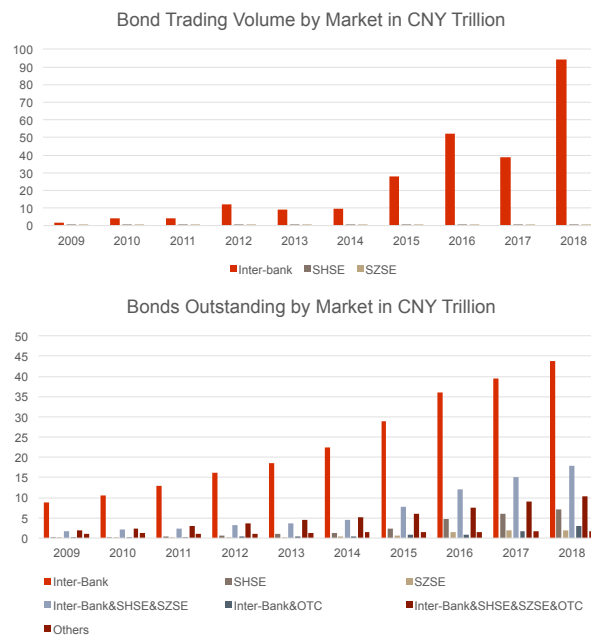


### China's Bond Market is Second Largest in the World as of June 2019

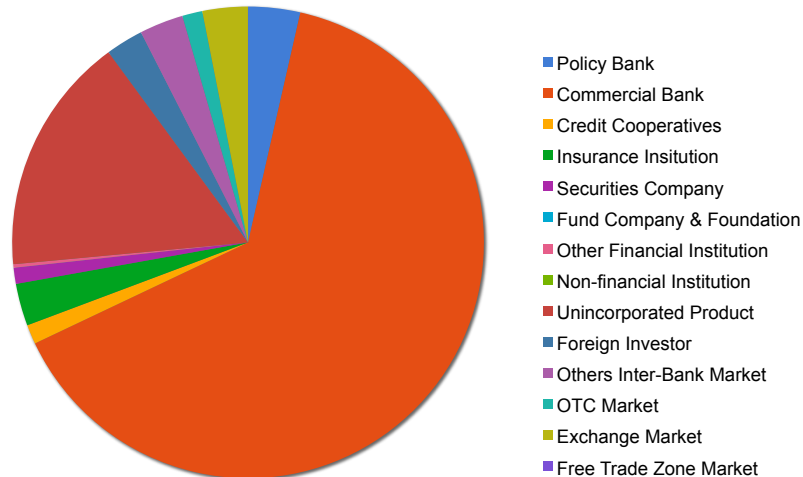


Source: BIS as of 2018 Q1

Most bonds are listed and traded in the Inter-Bank Market, though some are traded on the stock exchanges or OTC.



### Bond Investor Composition 2018

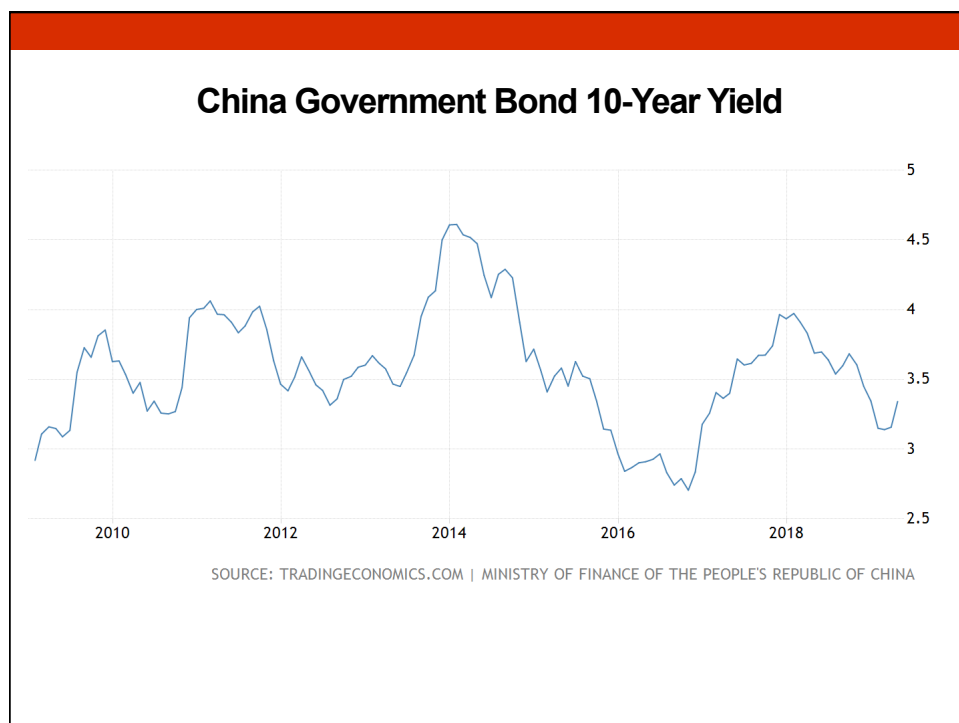
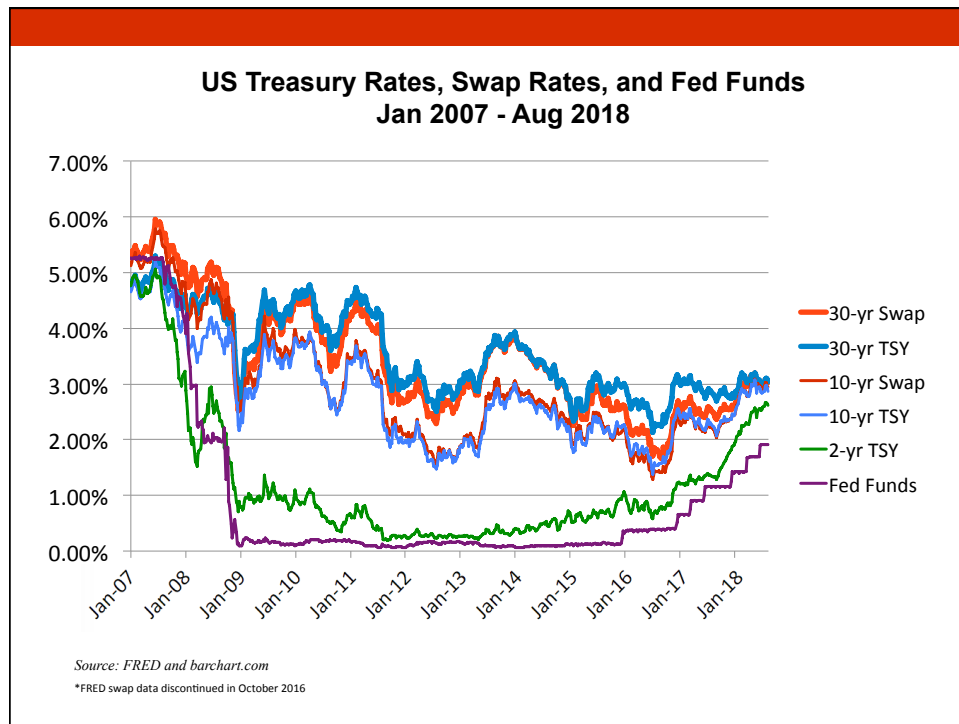


Data source: Chinabond, Major Bonds Holding Structure.

★ Commercial banks are still by far the biggest holders of Chinese bonds.

### China's Bond Market Opens Up to Global Investors

- In Feb 2016, the PBoC announced the opening of China's interbank market to foreign investors.
- In Jan 2017, Bloomberg announced the inclusion of some CGB in some of its Bloomberg Barclays aggregate indexes.
- China would welcome foreign capital inflows but foreign investors still only hold a tiny share of the market.
- In Apr 2019, Bloomberg added over 300 CGBs to bond index.
- The bond market represents an alternative to bank financing, and a potential place to reallocate corporate risks, off bank balance sheets and into other portfolios.
- As we shall see, the Chinese Government Bond returns have low correlation with US Treasury bond returns.
- Thus, global bond investors might welcome the opportunity for diversification.



### Chinese Government Bonds Difference Between 10-Year and 1-Year Yields 2007-2017



Source: Bloomberg China government bond yield indexes (GCNY10YR and GCNY1YR).

Time-variation in the slope of the CGB curve may reflect rebalancing of monetary policy objectives between economic stimulus and containment of debt growth.

### Yield Curves in the Four Largest Economies August 2018

