Entering the World's Second Largest Bond Market

Aidan Yao
Senior Economist

Shirley Shen
Asia Economist

AXA INVESTMENT MANAGERS

China Bond Market Primer

Key Messages

Hans Stoter
Global Head of Core Investments

"With RMB now widely acknowledged as a reserve currency and with several global bond indices having included RMB bonds, we are seeing strongly increased interest by investors in this asset class. Their first priority is to understand the market before being ready to invest. Exactly for that purpose we have developed this bond primer: to help our clients to better understand what is already the 2nd largest bond market in the world. We look forward to sharing our expertise with you."

Gilles Moec
AXA Group Chief Economist and AXA IM Head of Research

"In 2001, China joined the WTO and increased its global market share dramatically to become the world's top exporter and manufacturer, and play a central role in global supply chains. China became an increasingly attractive location for investors in physical assets. Today, China is accelerating structural reforms to open up its financial system to the rest of the world. The RMB inclusion in the SDR basket, A-shares' inclusion in the MSCI and China bonds' entry into the Bloomberg Barclay Global Aggregate Index are concrete steps on this path.

Equipped with this China Bond Market Primer, and the broader supports of our teams, our investors will gain a clear and balanced vision of opportunities, but also pitfalls, offered by the world's third largest bond market."

Overview

China's bond market reached $17 trillion in Q3-2020, making it the world's second largest market after the US. The low market cap to GDP ratio compared with other markets suggests still significant growth potential ahead

There are three markets for RMB bonds, along with an active offshore market for hard-currency credits. **Rates and credit bonds are roughly of equal size, and predominantly owned by banks and mutual funds**

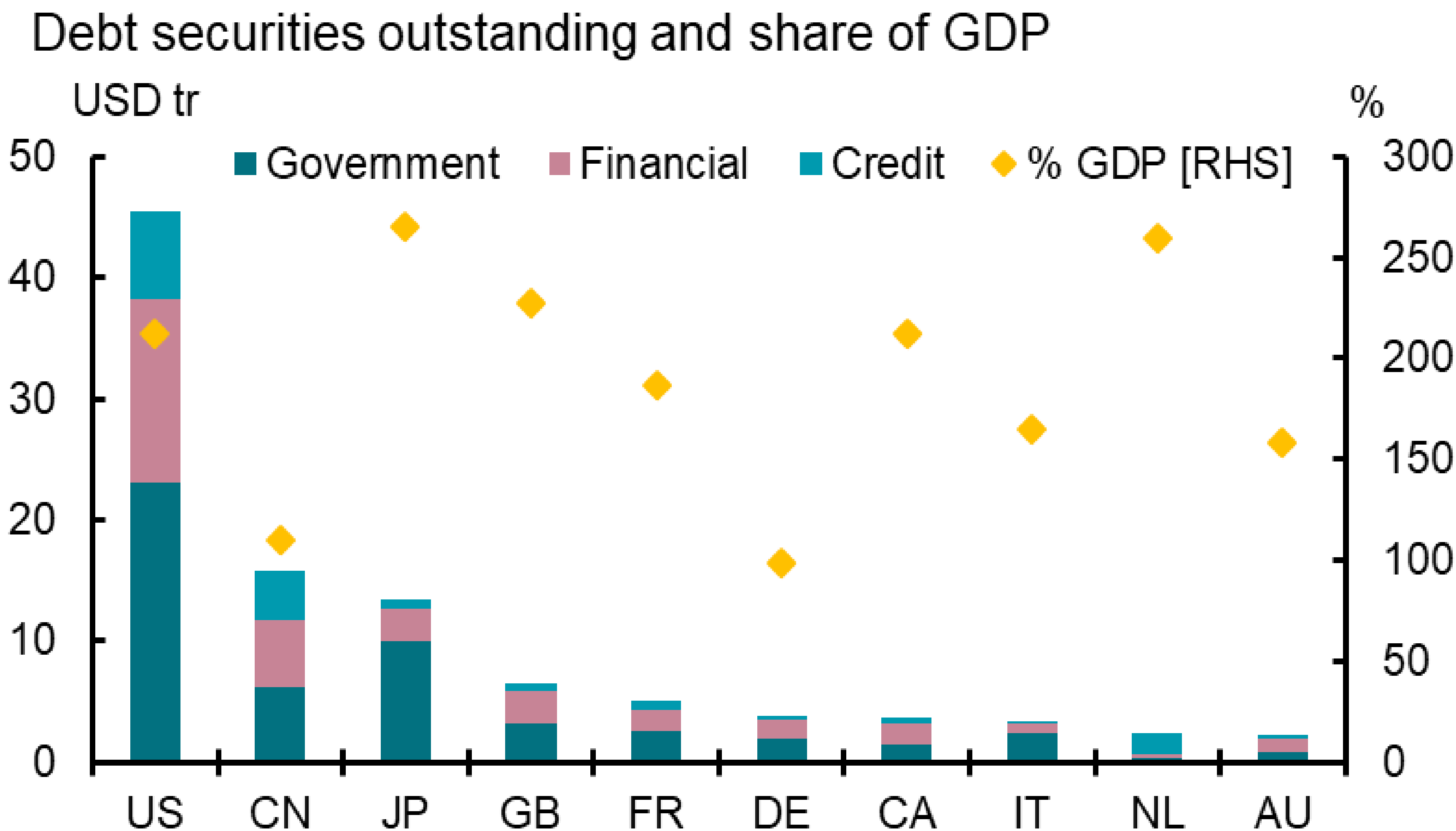
Foreign holdings represent c3% of the market and have grown rapidly in recent years. Foreign buying has so far concentrated in government bonds, supported by China's relatively high interest rate differential and index inclusion. Investment in onshore credit has progressed slowly due to more complex risk considerations

China has recently been added to all major international bond indices, and global reserve managers have started to allocate to RMB bonds for diversification. These secular trends are still in their infancy and could develop rapidly as China further opens its markets and investor confidence in RMB assets grows

RMB bonds have delivered solid performance relative to other markets. With onshore interest rates already back to pre-COVID levels and RMB on an appreciation path, China offers good returns prospects in a zero-rate environment. Our analysis shows that adding China to a global fixed income portfolio can visibly enhance its risk-return characteristics

China is home to the world's largest green bond market, with 2019 issuance accounting for over 20% of the global supply. While there are still some discrepancies between local and international standards, a large swath of the market *is* aligned with the global recognition of "green" and offers attractive risk-adjusted opportunities

China is the world's 2nd largest bond market, but its low market cap to GDP ratio suggests significant financial deepening still lies ahead



Source: BIS, and AXA IM Research. For indicative purposes only. As of 2021.

RMB bonds are traded in three separate markets, where regulations to unify them are underway

Onshore interbank bond market

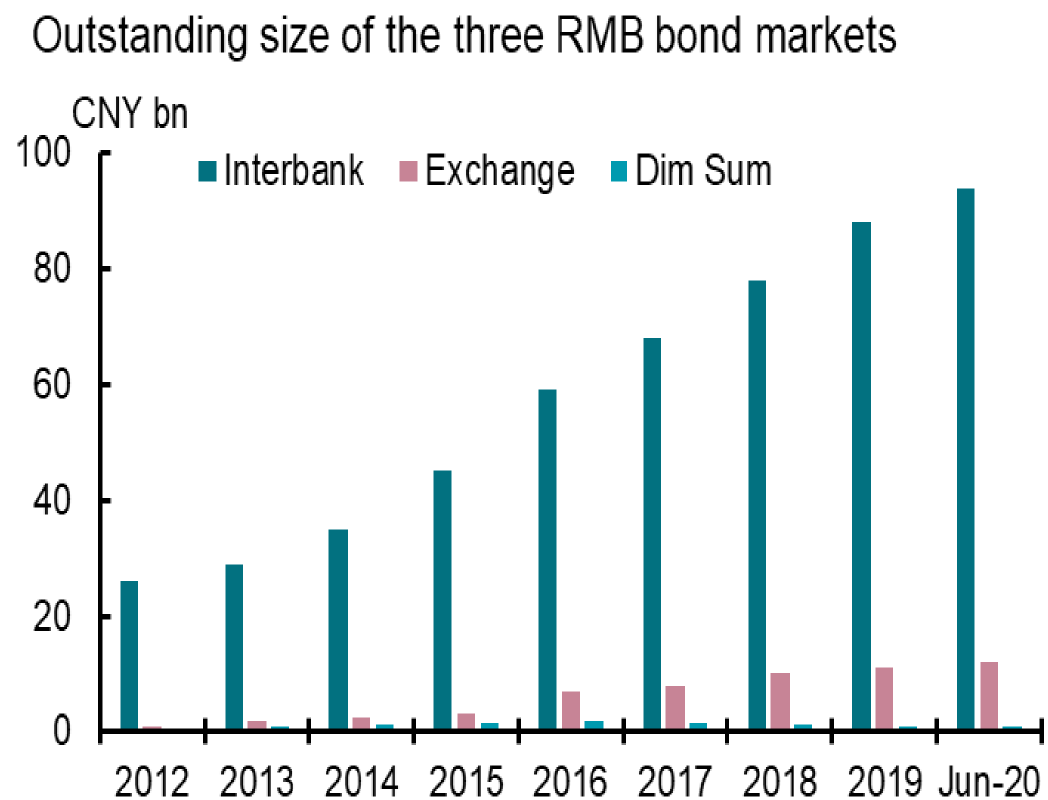
- This is the largest RMB bond market by far, accounting for 89% of bonds outstanding, 90% of issuance and 96% of trading volumes in 2019
- Most types of onshore bonds are traded in the interbank market, with active repo transactions

Onshore exchange market

- A much smaller market, but has grown sharply since 2016 after policy loosening
- Less liquid, but certain bond types, such as convertible bonds, are only traded on the exchange

Offshore RMB bond market – Dim Sum bonds

- The smallest market, but freely accessible to foreign investors without additional set-up requirements
- Issuance and investment are based on local laws



Source: Wind, Bloomberg, SC research, and AXA IM Research. For indicative purposes only. As of 2021.

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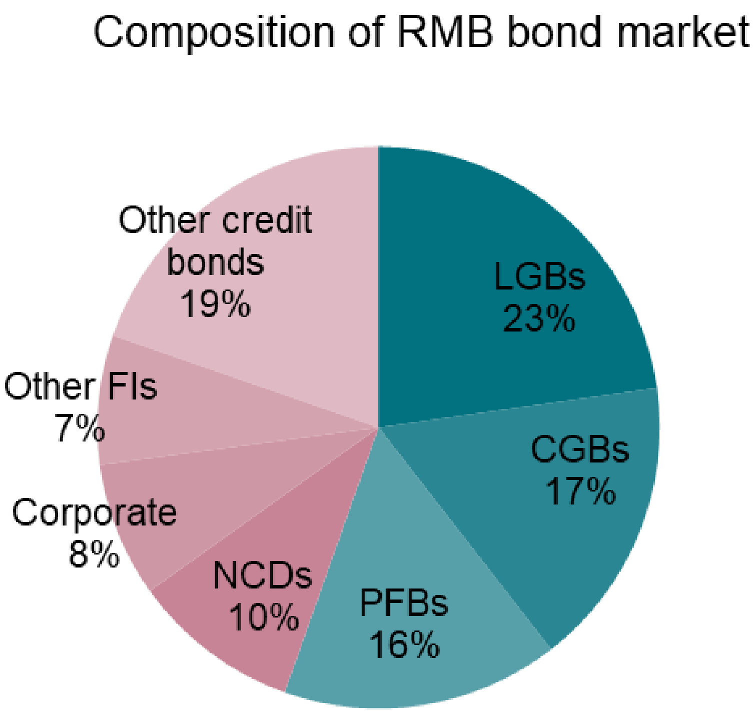
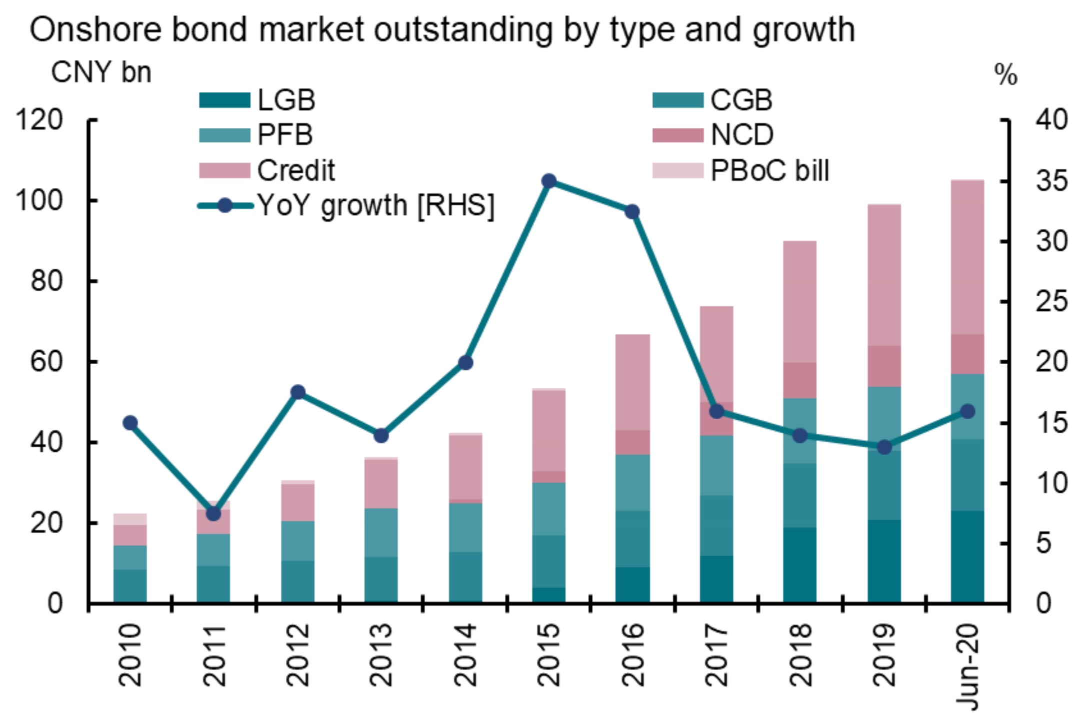
Market is made up of 56% government-related bonds and 44% credits; Onshore market has maintained double-digit growth in the past decade

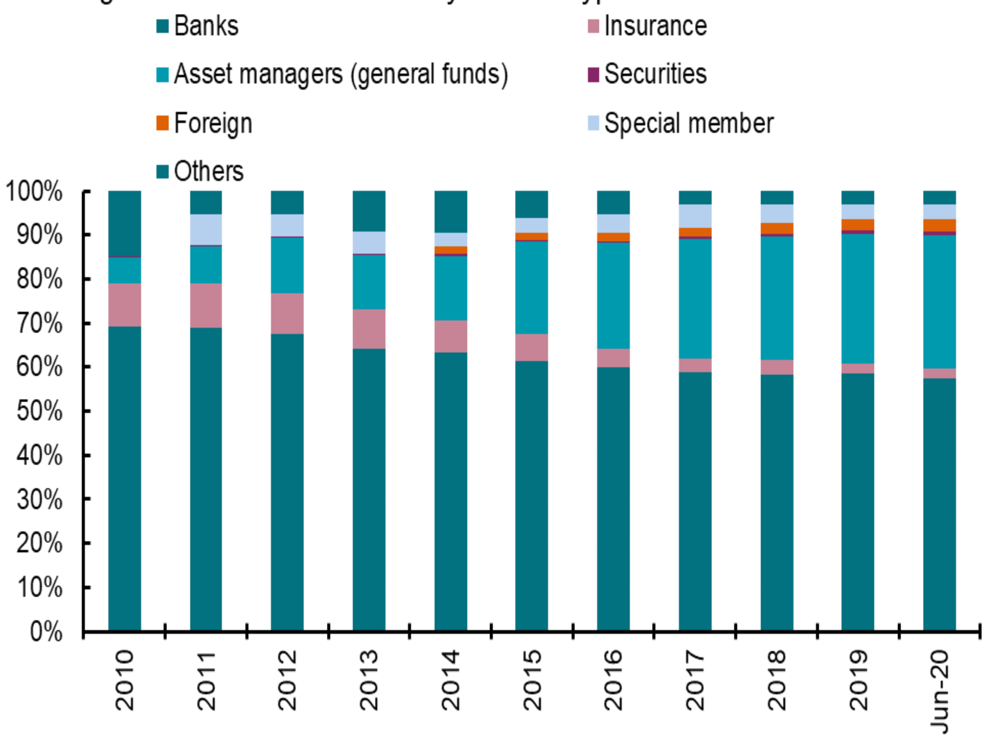




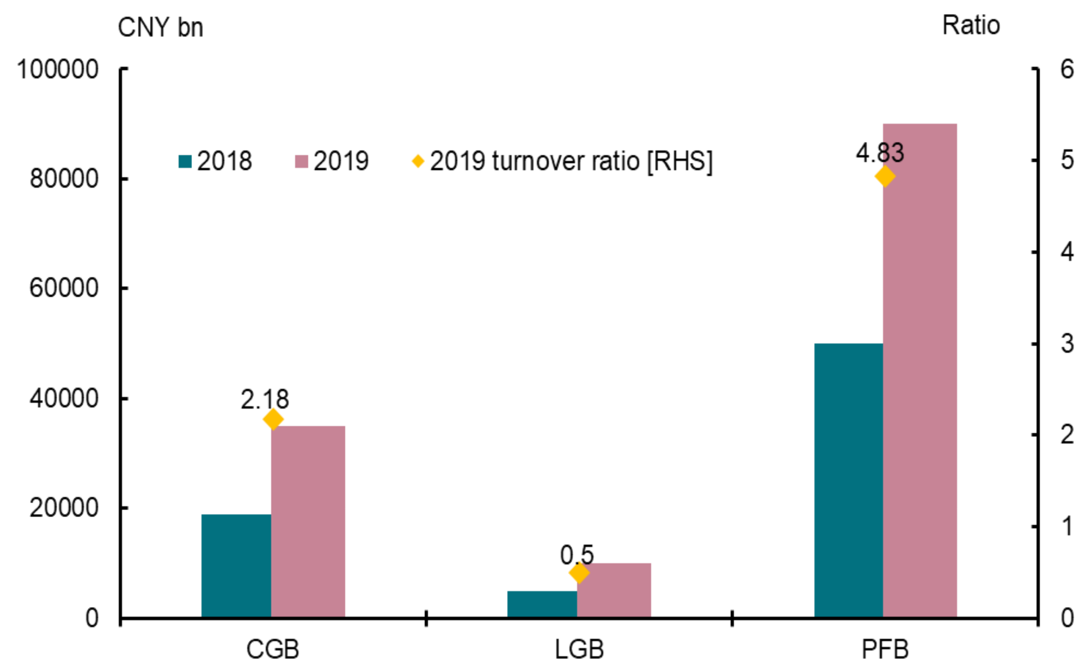
Source: WIND, ChinaBond, SC, and AXA IM Research. For indicative purposes only. As of 2021.

Banks are the largest holders of bonds, but funds are catching up; Secondary market liquidity continues to improve

Holding structure of bond market by investor type



Interbank turnover volume by type



Source: CCDC, SHC, WIND, SC, and AXA IM Research. For indicative purposes only. As of 2021.

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China continues to liberalize the onshore markets by streamlining regulations and expanding access channels

	New changes	Previous	Implication
Fund management rules	Fund management rules for QFII and RQFII regimes are consolidated into one paper	QFII and RQFII regimes are subject to different sets of rules	Investors only need to file applications once
Quota management	Removed	Subject to individual quotas (both QFII and RQFII) and country quotas (RQFII)	Catches up with other quota-free channels, such as Bond Connect and CIBM Direct
Capital injection currency	Investors may inject foreign currency or RMB as per their investment needs. Injection and repatriation currency should be largely the same	QFII investors may only remit foreign currency , and RQFII investors may only remit offshore RMB	More flexible in capital injection
Profit repatriation process	Tax commitment letters required	Audit report issued by a Chinese certified public accountant and tax filing certificates required	Procedures are significantly simplified
Number of custodians	Investors can choose multiple domestic custodians and appoint one main custodian	Investors can only appoint one custodian for QFII and three custodians for RQFII	More flexibility to appoint different custodians for different lines of product to avoid concentration
Trading instrument	Both QFII and RQFII were given green light to conduct repo transactions	No access to conduct repo	Enrich qualified foreign investors' tollkit for asset allocation and risk management

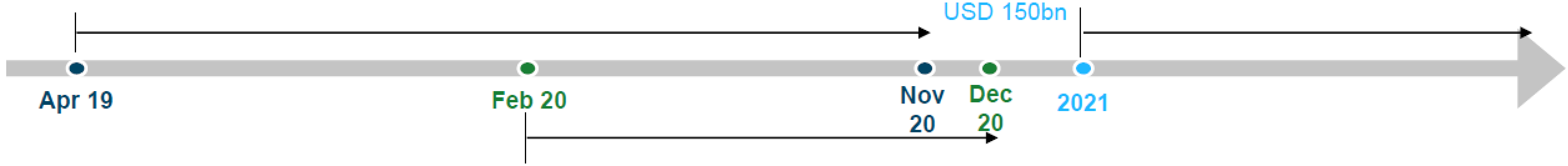
Source: SZSE, SAFE, PBoC, SC research, and AXA IM Research. For indicative purposes only. As of 2021.

China has recently been added to major international bond indices; Passive inflows alone could ensure steady buying of RMB bonds

In April 2019, the Bloomberg-Barclays Global Aggregate bond index started to include CGB and policy bank bonds, marking the first time China onshore bonds were included in global bond indices. In February 2020, the JP Morgan GBI-EM bond index started to include CGBs. In October 2020, FTSE Russell World Government Bond Index announced the inclusion of CGB, with implementation starting end-2021. China is now included in all three major global bond indices.

Bloomberg Barclays Global Aggregate Index:
Including CGBs and PFB; 20-month process from April 2019-November 2020;
China's weighting: c.6%; estimated passive inflows: USD 120bn

FTSE Russell World Government Bond Index:
We expect CGB inclusion to start in 2021;
China's weighting: c.6%; estimated passive inflows: USD 150bn



JP Morgan Government Bond-Emerging Market Index:
Has started to include CGBs; 10-month process from February-December 2020 (paused in March 2020)
China's weighting: c.10%; estimated passive inflows: USD 20bn

	Bloomberg Barclays GAI	JP Morgan GBI-EM	FTSE WGBI
Tracking AUM	USD 2-2.5trn	USD 200bn	USD 2-3trn
Potential weighting	6.06%	7-10%	5.6%
Potential inflows	120-150bn	14-20bn	USD 110-170bn
Instruments included	Government and policy bank bonds	Government bonds	Government bonds

Source: Bloomberg, FTSE, JP Morgan, SC and AXA IM Research. For indicative purposes only. As of 2021.

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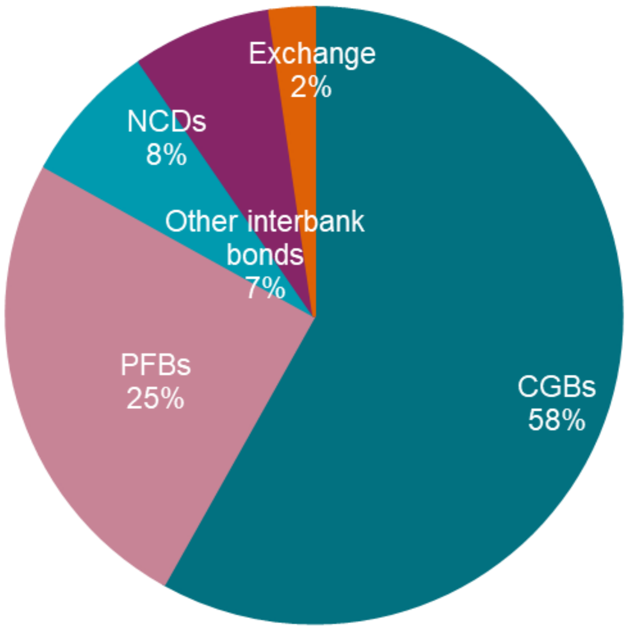
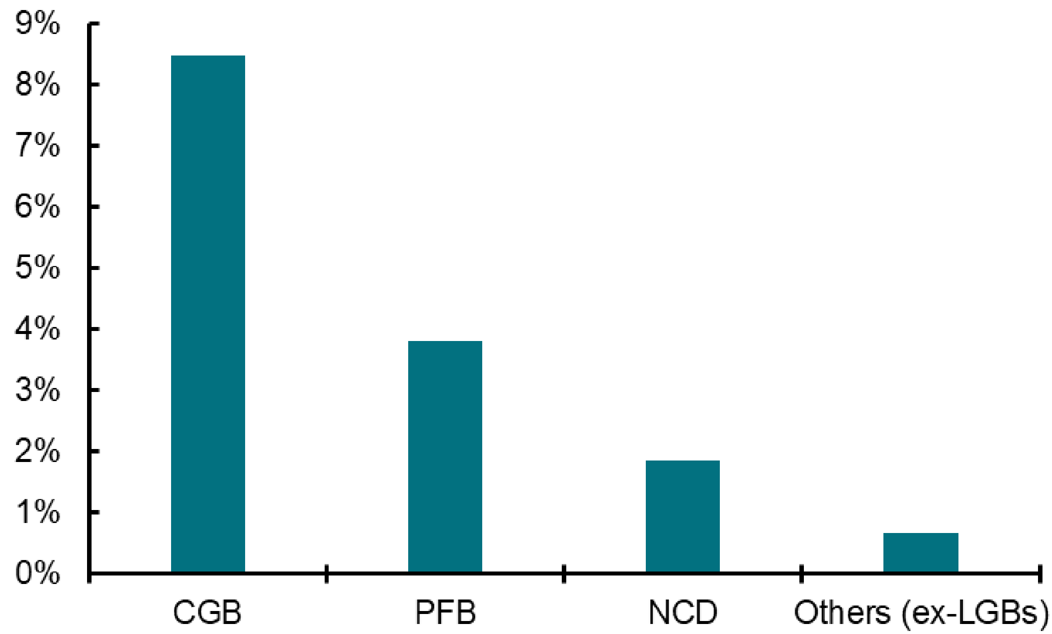
Foreign ownership has risen significantly to close to 3% of the market; But buying so far has been concentrated in government bonds

Percentage of foreign holding in onshore market

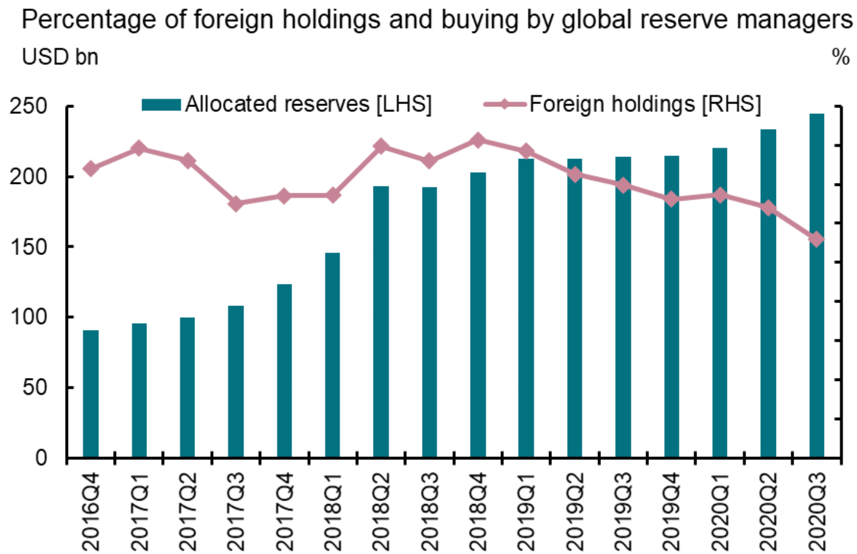


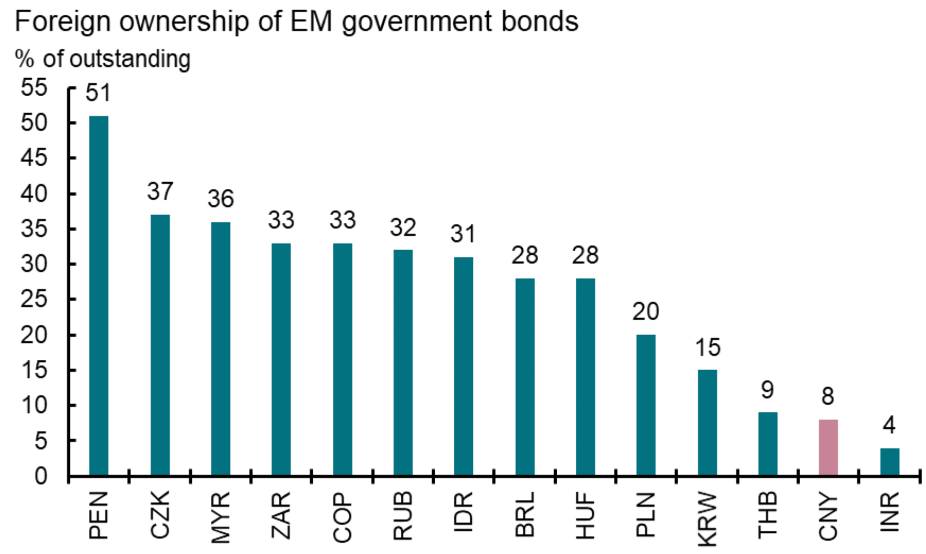
Foreign holdings as percentage of the market

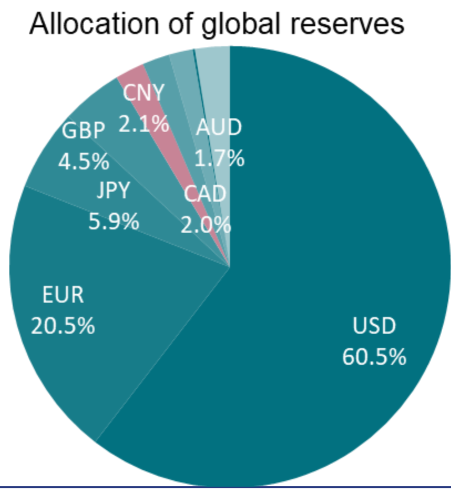


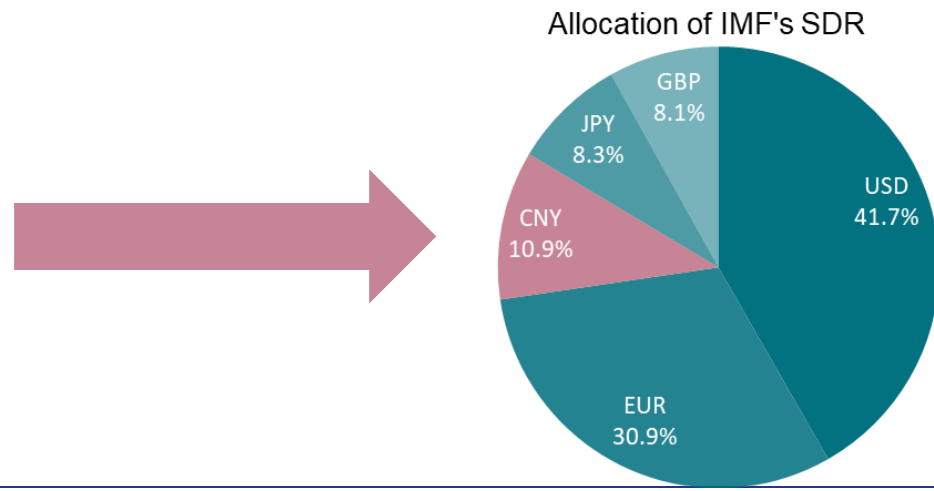
Source: CCDC, SHC, WIND, SC, and AXA IM Research. For indicative purposes only. As of 2021.

RMB’s share in global reserves has risen to c2%; Both official and private holdings of RMB have large room for growth









Source: IMF, PBoC, and AXA IM Research. For indicative purposes only. As of 2021.

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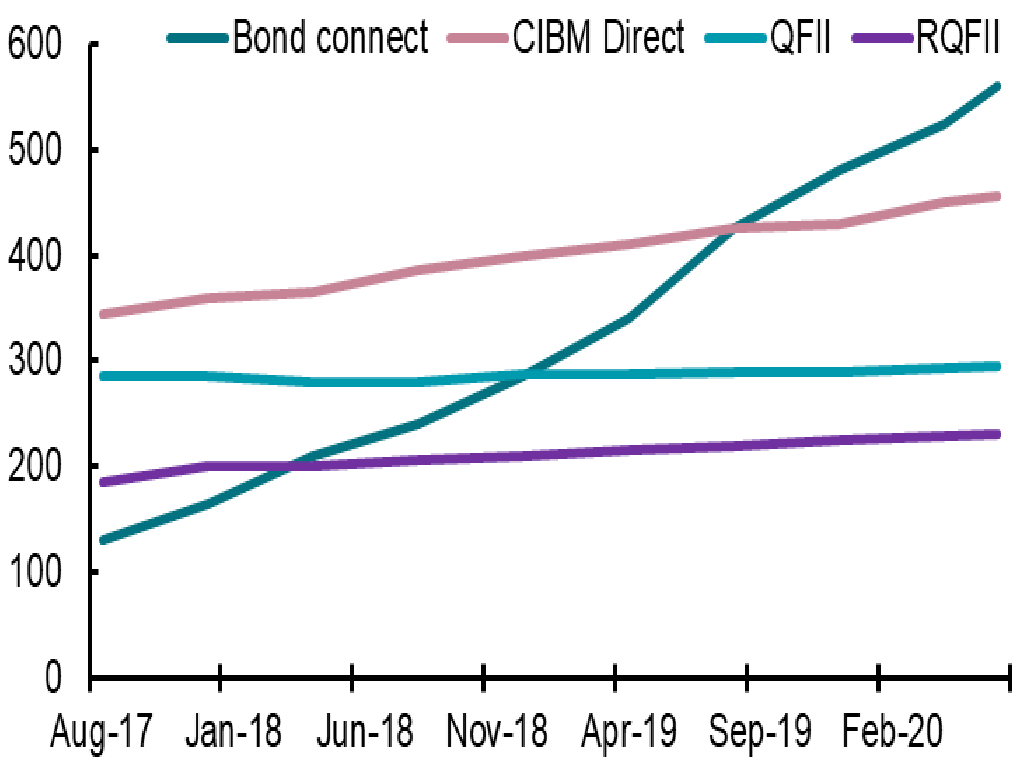
Bond Connect is the most popular way to access onshore markets, where large foreign institutions are competing for business

Number of registered institutional investors



Top asset managers' accessibility to China

		AUM (EUR bn)	QFII	RQFII	CIBM Direct	Bond Connect
1	BlackRock	6,704	√	√	√	√
2	Vanguard AM	5,625	√	√		√
3	Fidelity Investments	2,852	√	√		√
4	SSGA	2,776	√	√	√	√
5	Capital Group	1,833	√		√	√
6	J.P. Morgan AM	1,805	√	√	√	√
7	BNY Mellon IM	1,709	√			√
8	PIMCO	1,707	√	√	√	√
9	Amundi	1,653	√	√	√	√
10	Goldman Sachs AM	1,500	√	√		√
11	Legal & General IM	1,412			√	√
12	PGIM	1,382				√
13	Invesco	1,093	√			√
14	T. Rowe Price	1,075	√		√	√
15	Wellington Management	1,029		√		√
16	Nuveen	948				√
17	Natixis IM	934				
18	Northern Trust AM	906	√			√
19	SuMi TRUST	829	√			√
20	UBS AM	806	√	√	√	√
21	AXA IM	801	√	√	√	√
22	Insight Investment*	781			√	√
23	DWS Group	767		√		√
24	PGIM Fixed Income*	760				√
25	Legg Mason	716	√		√	

Source: PBoC, SC, and AXA IM Research. For indicative purposes only. As of 2021.

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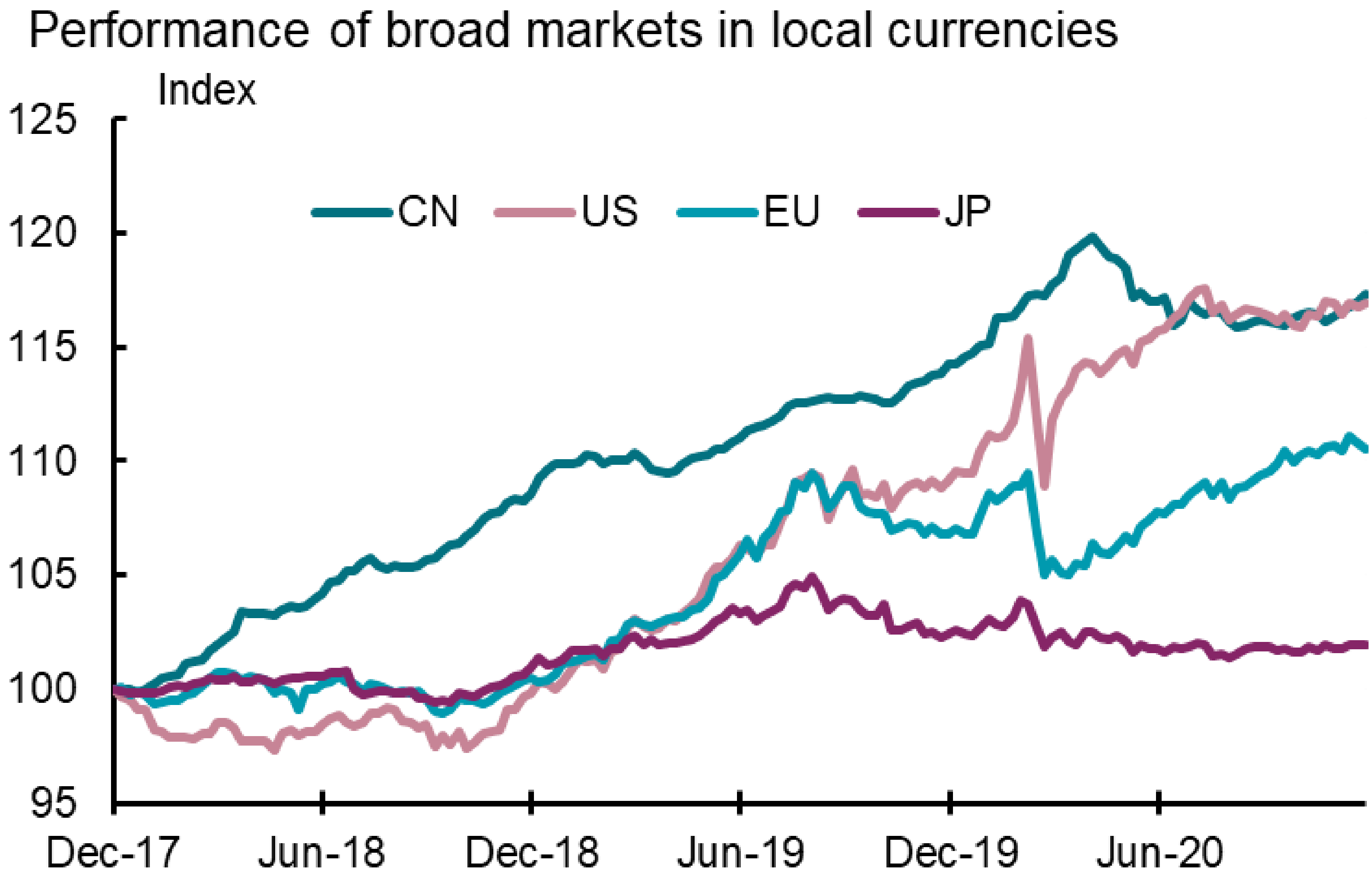
RMB Bonds: Relative Value

Chinese bond market has generated solid performance with low volatility relative to peers



Source: ICE BofA, Bloomberg, and AXA IM Research. For indicative purposes only. As of 2021.

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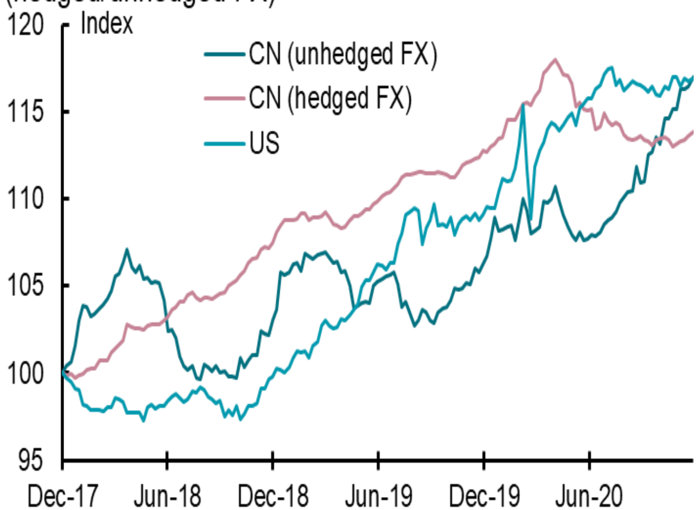
Relative performance varies depending on how FX risks are managed

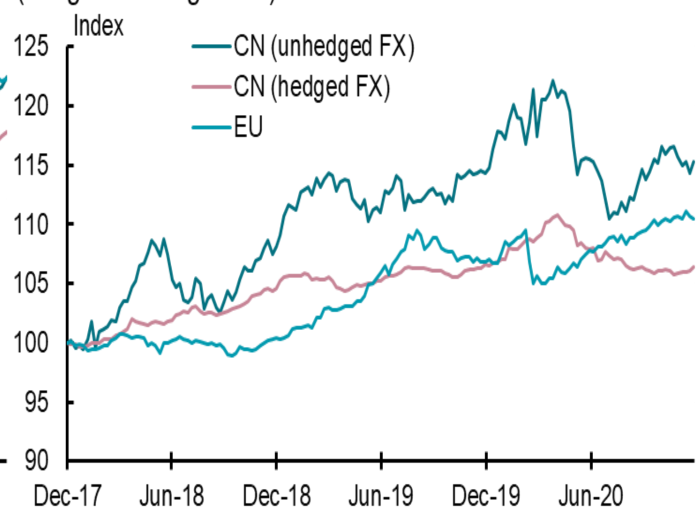
USD-based investors

Performance of broad markets US and CN (hedged/unhedged FX)



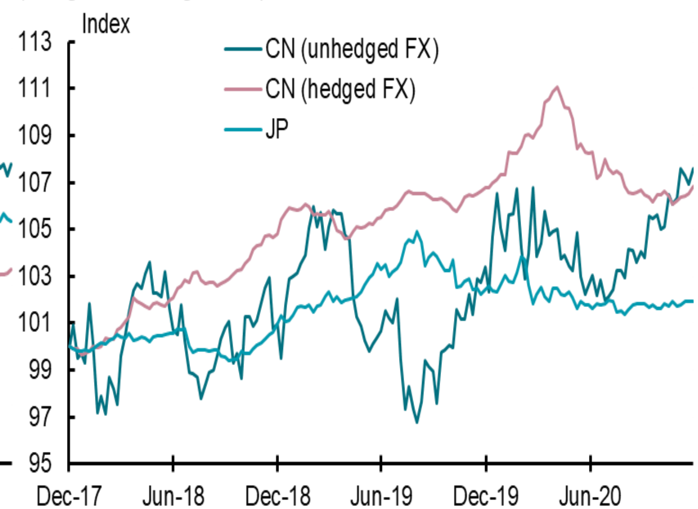
EUR-based investors

Performance of broad markets EU and CN (hedged/unhedged FX)



JPY-based investors

Performance of broad markets JP and CN (hedged/unhedged FX)



- **Hedging FX exposure was beneficial up until Mar-2021, but it underperformed following the yield back-up since then**
- **RMB appreciation since June-2020 helped to recoup performance of the unhedged strategy**

- **Hedging FX exposure produced mixed performance for EUR investors, with the recent yield rise particularly damaging**
- **Unhedged strategy produced better results despite a mild depreciation in CNY/EUR**

- **RMB bonds deliver better accumulated performance than JPY bonds regardless how FX risks are managed**
- **Hedging FX risk produces more return stability, resulting in a higher Sharpe ratio than the unhedged strategy**

Source: ICE BofA, Bloomberg, and AXA IM Research. For indicative purposes only. As of 2021.

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Chinese bonds offer attractive return prospects particularly if FX risk is left unhedged

<table>
<tr><th colspan="10">China vs. the United States</th></tr>
<tr><th></th><th>Yield</th><th colspan="2">Hedging FX</th><th colspan="2">No Hedging FX</th><th>Foreign Yield</th><th colspan="2">Premium/Discount (%)</th></tr>
<tr><th></th><th>In local currency</th><th>Hedging costs*</th><th>Hedged Yield</th><th>Consensus FX move</th><th>Unhedged Yield</th><th>In foreign currency</th><th>Hedged</th><th>Unhedged</th></tr>
<tr><td>CGB (10-year)</td><td>3.16</td><td rowspan="3">1.1</td><td>2.06</td><td rowspan="3">2%</td><td>5.16</td><td rowspan="2">1.15</td><td>0.91</td><td>4.01</td></tr>
<tr><td>PBB (10-year)</td><td>3.53</td><td>2.43</td><td>5.53</td><td>1.28</td><td>4.38</td></tr>
<tr><td>CN Corporate (IG)</td><td>3.84</td><td>2.74</td><td>5.84</td><td rowspan="2">1.91</td><td>0.83</td><td>3.93</td></tr>
<tr><td>Offshore IG (USD)</td><td>2.36</td><td>-</td><td>2.36</td><td>-</td><td>2.36</td><td>0.45</td><td>0.45</td></tr>
<tr><td>Offshore HY (USD)</td><td>8.65</td><td>-</td><td>8.65</td><td>-</td><td>8.65</td><td>4.31</td><td>4.34</td><td>4.34</td></tr>
</table>

* Using 10-year cross currency swap

<table>
<tr><th colspan="9">China vs. Europe</th></tr>
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<tr><td>CGB (10-year)</td><td>3.16</td><td rowspan="3">1.88</td><td>1.28</td><td rowspan="3">0.3%</td><td>3.46</td><td rowspan="2">-0.5</td><td>1.78</td><td>3.96</td></tr>
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<tr><td>Offshore IG (USD)</td><td>2.36</td><td>-</td><td>2.36</td><td rowspan="2">-1.6%</td><td>0.76</td><td>2.14</td><td>0.54</td></tr>
<tr><td>Offshore HY (USD)</td><td>8.65</td><td>-</td><td>8.65</td><td>7.05</td><td>2.7</td><td>5.95</td><td>4.35</td></tr>
</table>

* Using cross currency swap and forward

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<tr><td>CGB (10-year)</td><td>3.16</td><td rowspan="3">1.47</td><td>1.69</td><td rowspan="3">1.8%</td><td>4.96</td><td rowspan="2">0.03</td><td>1.66</td><td>4.93</td></tr>
<tr><td>PBB (10-year)</td><td>3.53</td><td>2.06</td><td>5.33</td><td>2.03</td><td>5.30</td></tr>
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<tr><td>Offshore IG (USD)</td><td>2.36</td><td>-</td><td>2.36</td><td rowspan="2">-0.2%</td><td>2.16</td><td>1.95</td><td>1.75</td></tr>
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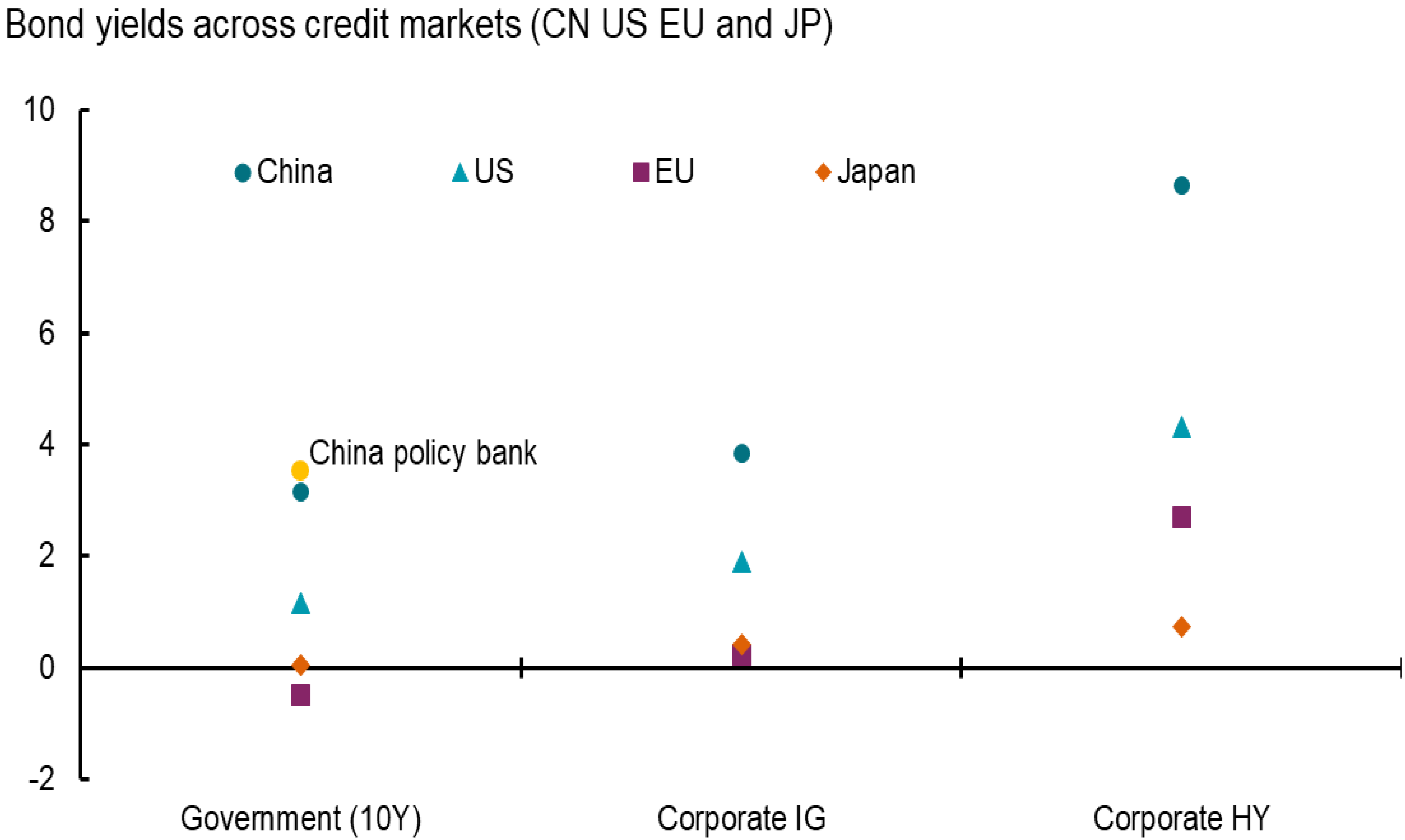
</table>

* Using cross currency swap and forward

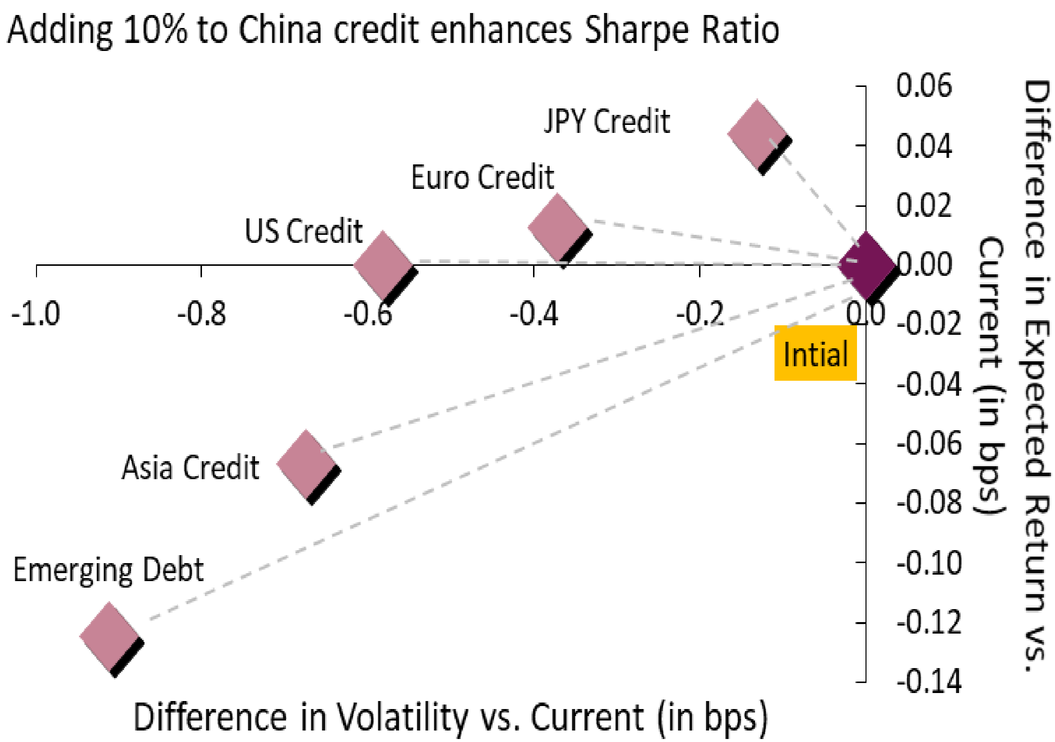
Source: Bloomberg, and AXA IM Research. For indicative purposes only. As of 2021.

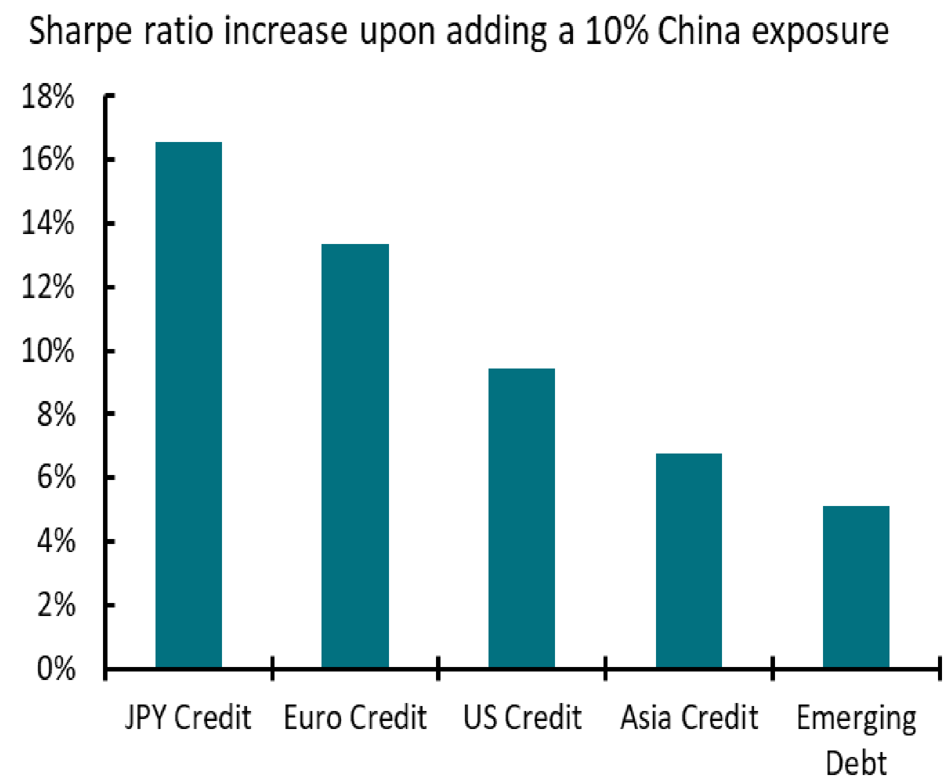
China offers attractive yields across credit spectrum



Source: ICE BofA, Bloomberg, and AXA IM Research. For indicative purposes only. As of 2021.

Adding China to a global portfolio improves risk/reward features





Source: AXA IM Research. For indicative purposes only. As of 2021.

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Green Bond Market

Overview

China was the world's largest green bond market in 2019, with total issuance of $55.8bn accounting for 21.5% of global supply. If only CBI-aligned bonds are considered, China was the second largest issuer after the US

Chinese green bonds are used to finance a wide range of projects, including renewable energy, electric transportation, energy-efficient buildings, etc**.** Large banks and government-backed entities are the main issuers, which helps to **enhance the credit quality of these bonds**

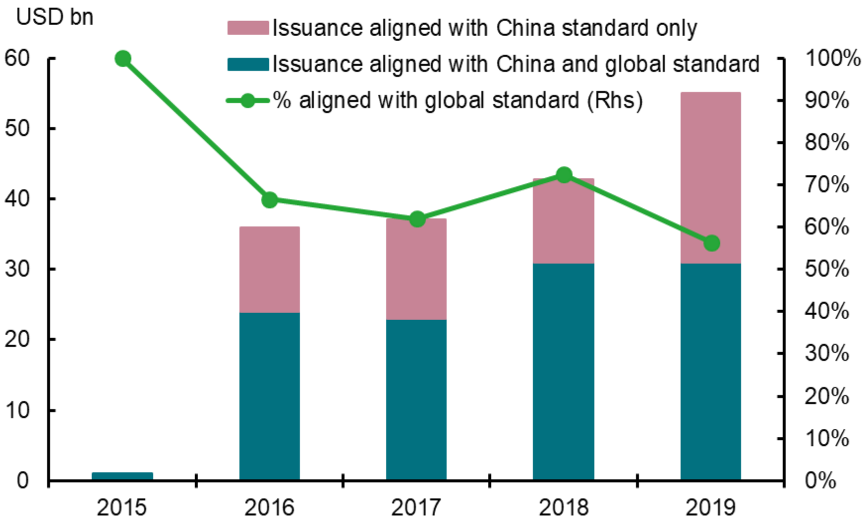
There remain some discrepancies between the local and international standards, although these differences have narrowed over time. The use of proceeds – for working capital and non-eligible projects – remains the key reason for exclusion from international labelling

In 2019, $31.3bn worth of Chinese green bonds were aligned to both local and international standards. Of the $24.5bn excluded from the CBI database, **at least half ($12.4bn) were allocated to CBI-eligible projects**. The investable universe for investors who strictly follow the global standards is therefore larger than the headline figure suggests

China green bond indices have proliferated in recent years as the market grew and "investing in Green" became mainstream. The ChinaBond Climate-Aligned Bond Index and the FTSE Chinese (Onshore CNY) Internationally-Aligned Green Bond Index are two benchmarks that are aligned with the CBI green bond standards. **Both have significantly outperformed their global peers in recent years, and continue to offer attractive risk-return characteristics**

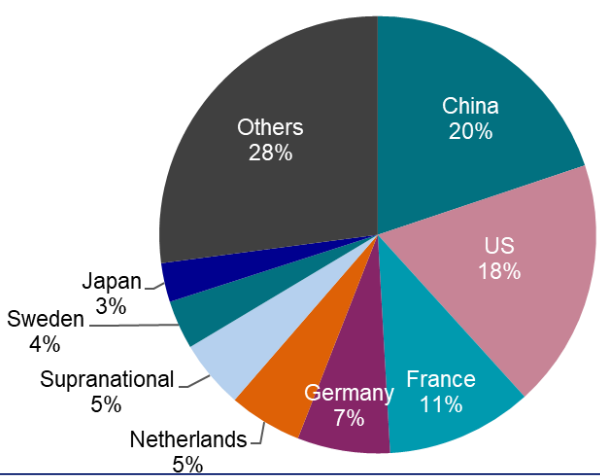
World's largest green bond market continues to grow at full speed

China green bond issuance aligned with local and global standards

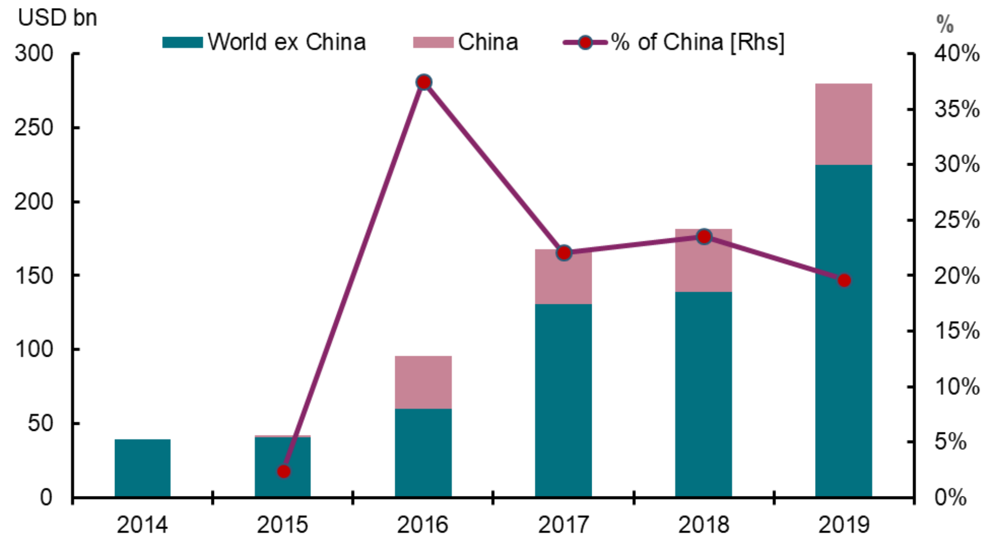


- Strong regulatory push spurs tremendous growth in the China green market since 2016
- Bond issuance surged 33% to reach $55.8bn in 2019
- China was the world's largest market by issuance, accounting for 21.5% of global supply
- China and the US are leaders in green bond supply, followed by France and other European countries

Top green bond issuers (2019)



Global green bond issuance aligned with CBI standards



Source: CBI, Wind, and AXA IM Research. For indicative purposes only. As of 2021.

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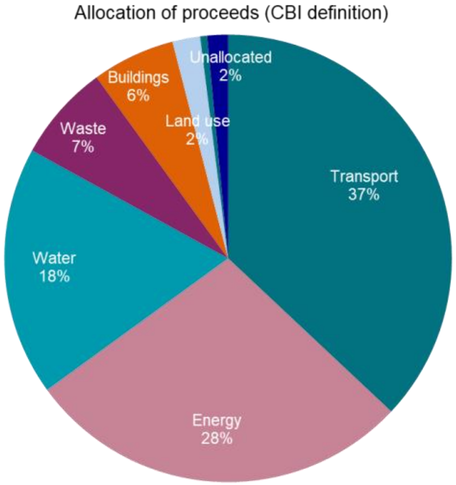
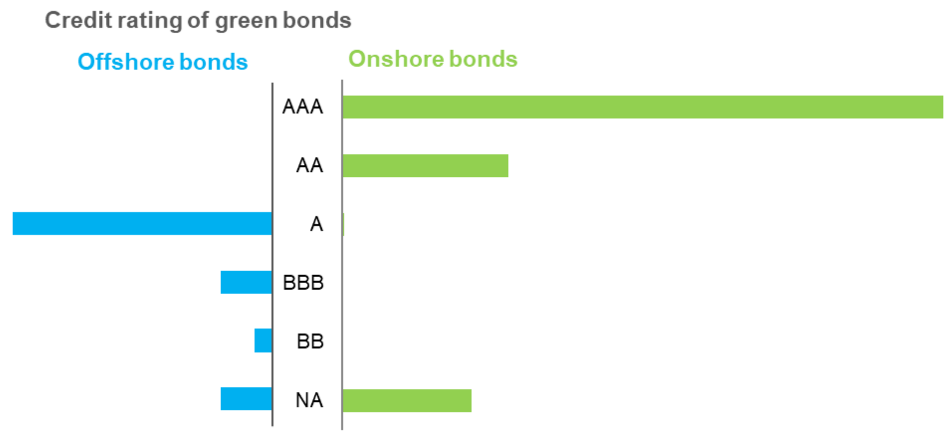
China green bonds are highly-rated and used to finance diverse projects

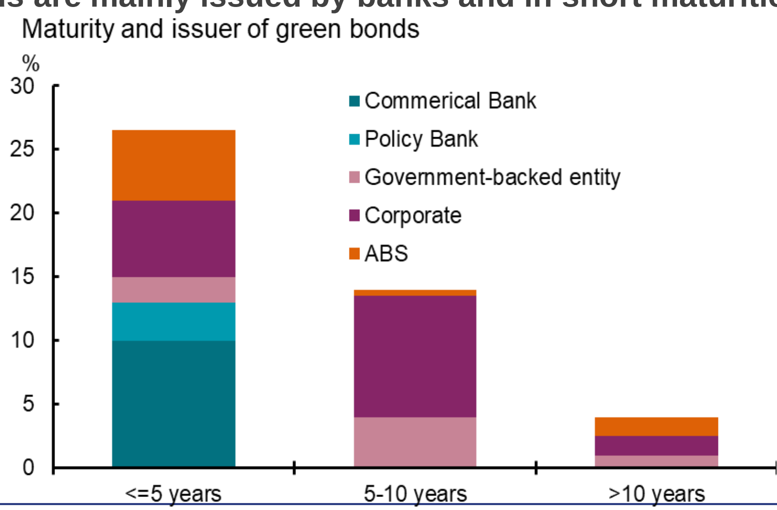
China green bonds finance a diverse set of projects



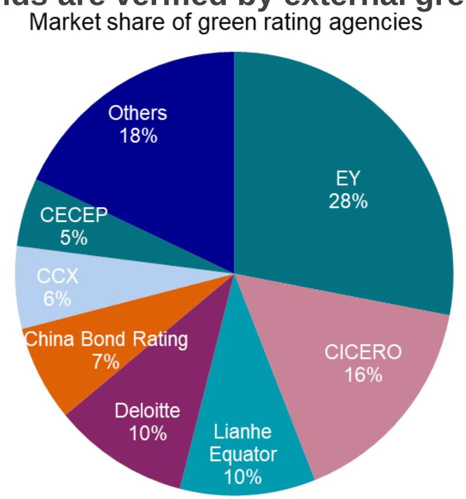
Green bonds are highly rated in both onshore/offshore markets



Bonds are mainly issued by banks and in short maturities



Majority of bonds are verified by external green experts

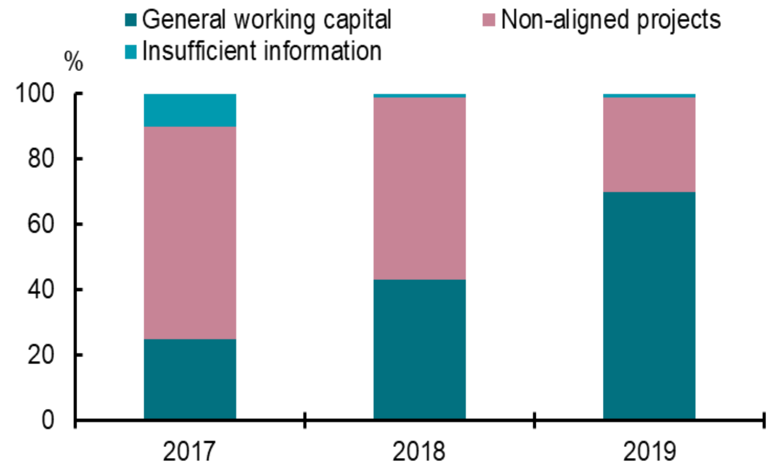


Source: CBI, Wind, and AXA IM Research. For indicative purposes only. As of 2021

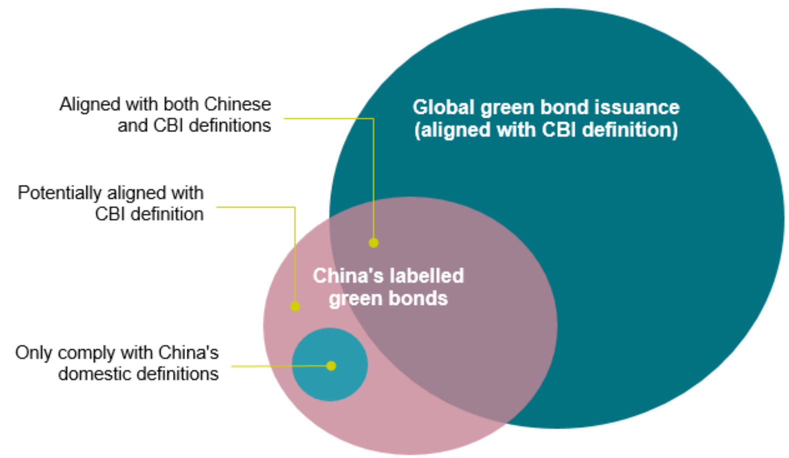
Discrepancies in green definitions still exist and reflect different environmental challenges faced, but these gaps are closing

- Despite sharing the common purpose of promoting sustainable development, there remain some discrepancies between international and China's local green standards
- International guidelines, such as the Climate Bonds Taxonomy, pay more attention to climate change mitigation, consistent with the goals of the Paris Climate Agreement to limit temperature rise to under 2 degrees
- China's domestic standards support projects that reduce greenhouse gas emissions, but also encourage investment in pollution reduction, resource conservation and ecological protection, which may not necessarily be aligned with the CBI rules
- Practically, China's green bonds are excluded from the CBI label for three reasons. Those that allocate more than 5% of proceeds to working capital accounted for 70% of the exclusion in 2019. Bonds that finance projects aligned with China's domestic standards but not CBI Taxonomy (e.g. clean coal) accounted for most of the rest. Bonds that were excluded due to reporting deficiency made up less than 1%
- However, CBI research shows that of $24.5bn bonds that were not aligned with the global standards, at least $12.4bn were in fact allocated to eligible green projects. For example, one green bond, which allocated 15% of proceeds to working capital but the rest (85%) to CBI-aligned projects, was excluded despite the vast majority of its use consistent with the global rules

Categories of non-aligned green bonds



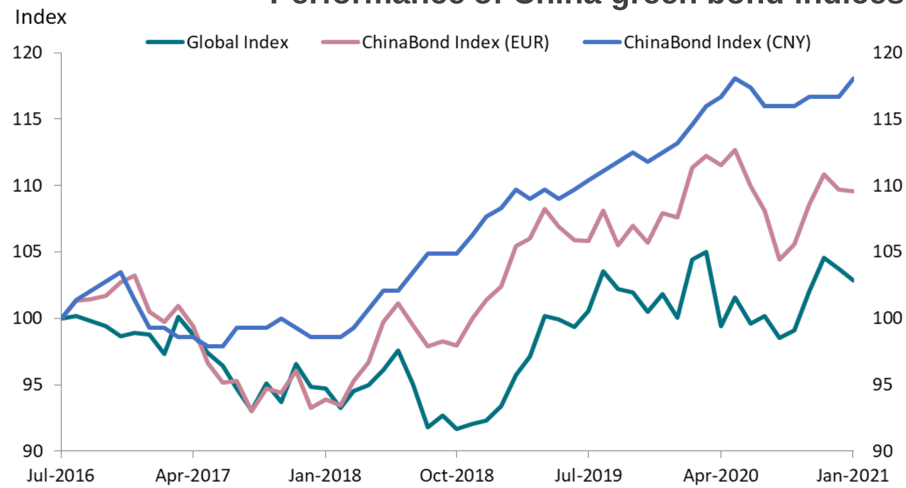
Volume of proceeds potentially aligned with CBI definition

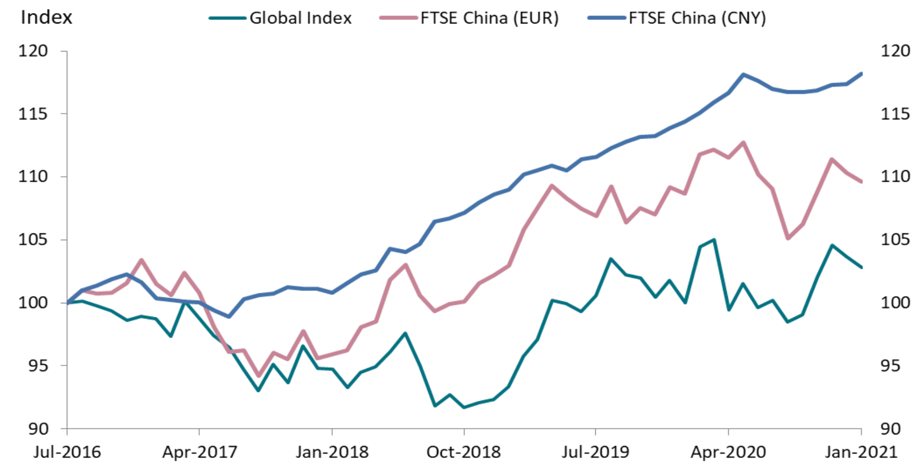


Source: CBI and AXA IM Research. For indicative purposes only. As of 2021.

China green bonds offer competitive returns and attractive yields

Performance of China green bond indices and Bloomberg Global Green Bond index





ChinaBond Climate-Aligned Bond Index	Latest
Market value weighted duration	3.55
Average yield to maturity (%)	3.44
Average maturity (year)	4.46
Average coupon yield (%)	4.50
Total market capitalization	RMB1.35tn
Number of bonds	297
Green bond proportion (%)	99.99

FTSE Internationally-Aligned Index	Latest
Market value weighted duration	2.14
Average yield to maturity (%)	3.43
Average maturity (year)	2.80
Average coupon yield (%)	3.64
Total market capitalization	RMB167bn
Number of bonds	56
Green bond proportion (%)	>95%

Source: FTSE Russel, Bloomberg, ChinaBond and AXA IM Research. For indicative purposes only. As of 2021.

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