

Fixed Income Insights

MONTHLY REPORT - DECEMBER 2023 | CHINA EDITION

FOR PROFESSIONAL INVESTORS ONLY

PBoC quickly eases liquidity after strains from government bond issuance

The PBoC increased loans to the banking system to ease liquidity, after bond issuance to finance the Q4 fiscal stimulus had strained liquidity. Chinese 7-10-year govt spreads backed up, as G7 yields fell sharply. Chinese \$ HY credit rebounded on policy support measures. Renminbi joined the currency rally vs USD.

Macroeconomic backdrop - China may be a key global locomotive in 2024

China could still be a major contributor to growth in 2024, despite the property crisis and consumer uncertainty. Liquidity pressures were eased with additional loans from the central bank. (page 2)

Chinese bonds - Chinese curve flattened, as yields increased in shorts but edged lower in longs

The Chinese 10s/2s curve flattened, driven by higher short yields, as liquidity stresses increased. Lower borrowing costs in RMB vs USD may have attracted bond issuers into the RMB bond market, driven by higher Fed policy rates. (page 3)

Chinese and Asian bonds - Asian yields tracked US Treasuries lower

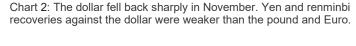
Asian 7-10-year yields fell in the November rally, but the movements in sovereign spreads vs US are mixed. (page 4)

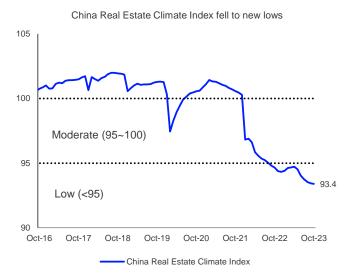
Performance - Developed Asian bonds led gains in November, helped by currency gains versus US dollar

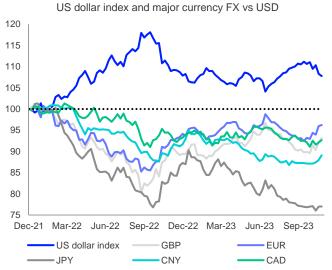
Australasian and Korean bonds gained 4-8%, outperforming Emerging Asia. Chinese \$ HY increased by 6.2%. (pages 5-6)

Appendix - Global bond market returns, historical bond yields, duration and market value, foreign exchange returns.

Chart 1: A composite property sector indicator fell further in October, as property sales and investments growth weakened.







Macroeconomic Backdrop - Growth and Inflation Expectations

Reluctance to forecast G7 recessions is evident in Consensus growth estimates for 2024. There is a marked narrowing in the US growth differential forecast over Europe, and oddly, slightly higher growth forecast for Europe in 2024, than 2023. Inflation dispersion is expected to decline, with inflation rising towards 2% in China and remaining above 2% in Japan.

Consensus 2024 forecasts show faster US than European growth, but with the differential narrowing (Chart 1). The IMF estimates APAC will account for two-thirds of global growth of 2023, helped by the stronger-than-expected performance in China, Japan, and India in the first half of 2023. China and India are projected to be major contributors to growth in 2024.

Headline inflation fell again in October, helped by weaker energy prices, and base effects. Chart 2 shows less dispersion in 2024 inflation forecasts, even if dispersion remains high by pre-Covid levels. Chinese inflation forecasts were revised much lower in 2023, as deflation pressure increased due to weaker demand. CPI shrank 0.2% y/y in October, as food prices weakened further.

The PBoC injected 1.45 trillion yuan of cash into the banking system through medium-term lending facility operations (MLF) in November (Chart 3), with the interest rate on loans unchanged. The aim is to provide ample liquidity to ease interest rate pressures in financial markets, after the October plan to sell additional sovereign bonds to finance fiscal stimulus added to liquidity stresses.

China's total social financing (TSF) growth increased to 9.3% y/y in October, with RMB loans growth staying at 10.7% (Chart 4). However, TSF m/m growth slowed to 1.8 trillion RMB (from 4.1 trillion in September), due to seasonal factors. But M2 growth was unchanged at 10.3%, supported by longer term saving deposits.

Chart 1: Consensus growth forecasts show a continuation of US exceeding European growth in 2024, as Fed tightening squeezes employment and demand. China remains the most unpredictable.

Latest Consensus Real GDP Forecasts (%, November 2023)								
	2022	2023	2024					
US	2.1	2.4	1.1					
UK	4.1	0.5	0.4					
Eurozone	3.3	0.5	0.6					
Japan	1.6	1.6	0.9					

Chart 3: The PBoC's injection of cash through MLF operations reaches a multi-year high in November, due to a large amount of loans expired this month and the fast growing demand in liquidity.

5.0

1.1

4.5

0.7

3.0

3.5

China

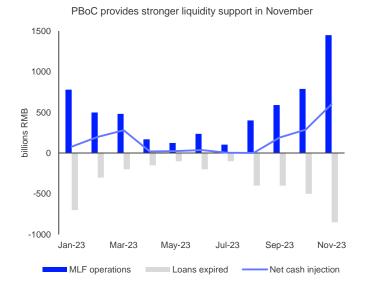
Canada

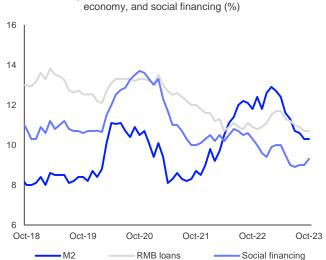
Chart 2: Consensus inflation forecasts show notable revisions higher for the UK, US and Japan in 2023 and 2024, but sizeable revisions lower to Chinese and Eurozone inflation in 2023.

Consensus Inflation Forecasts (%, November 2023)								
	2023	Change Since Jan-23 (Bps)	2024	Change Since Jan-23 (Bps)				
US	4.2	50	2.7	20				
UK	7.4	40	3.0	50				
Eurozone	5.6	-40	2.7	20				
Japan	2.9	110	2.2	90				
China	0.5	-180	1.8	-50				
Canada	3.9	20	2.5	30				

Chart 4: Total social financing growth remained at sub-10%, lower than the M2 growth, despite ticking up recently. Weak loan growth is depressing the broader money measures.

YoY growth in money supply, RMB loans to real





Chinese Government and Corporate Bonds

Chart 1: Chinese govt yields rose at the short end, after liquidity strains from increased govt bond sales to finance the budget stimulus. Longer yields fell despite the extra bond issuance.

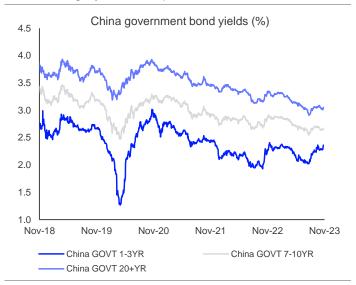


Chart 3: Chinese onshore spreads narrowed in November (except policy bank). Regional govt spreads have widened in recent years, in contrast to other onshore spreads which are now narrower.

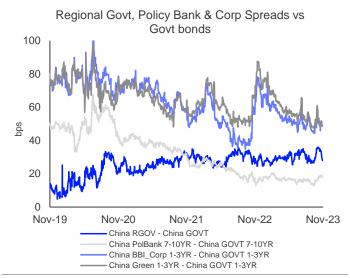


Chart 5: Monthly foreign inflows into Chinese govt bonds turned positive, despite higher US Treasury yields in October. The November data may capture the impact of increased Q4 issuance.

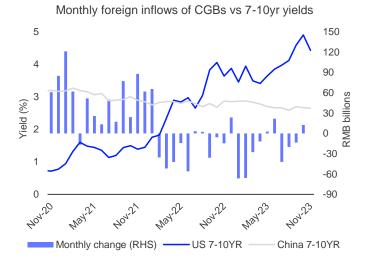


Chart 2: The Chinese 10s/2s curve flattened further, as short yields rose on liquidity strains. The US curve re-inverted, as 7-10-year yields fell and shorter yields were constrained by policy rates.

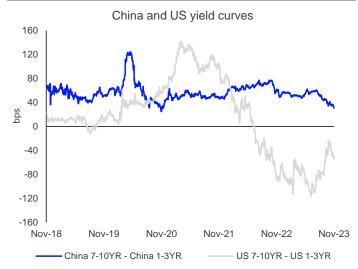


Chart 4: Chinese corporate yields in RMB remain much lower than their USD-based borrowing since the Fed raised rates. Lower RMB costs attracted borrowers into the RMB bond market for funding.

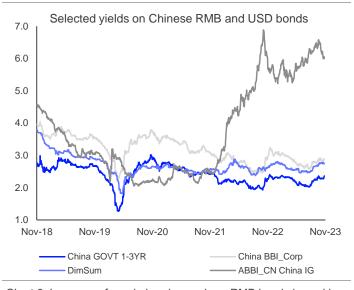
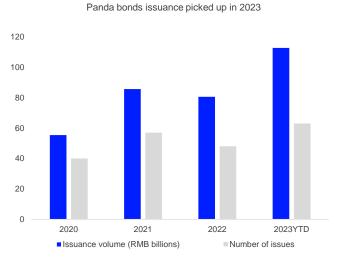


Chart 6: Issuance of panda bonds - onshore RMB bonds issued by overseas entities - rose in 2023, driven by lower borrowing costs in RMB vs USD, and the improved financing process by regulators.



China and Asian Bonds in Global Context

Chart 1: APAC 7-10yr yields broadly fell in November, tracking US yields lower. Yields on Philippine and Indonesian bonds fell more than peers, despite interest rate hikes in October.

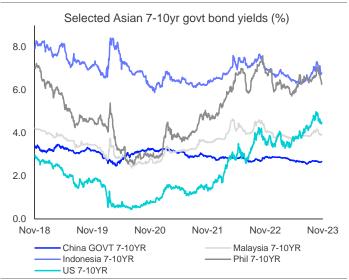


Chart 3: China 7-10-year spreads widened versus the G7, led by US and UK, as G7 yields eased from the peak in November. China spreads vs Japan also ticked up, as JGB yields fell with Treasuries.

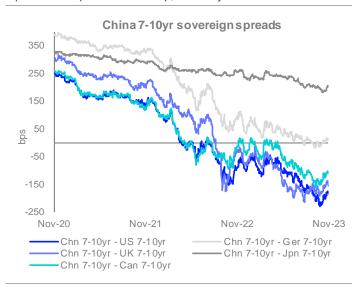


Chart 5: Chinese \$ HY spreads eased to 4800 bps in November, as regulators mulled supportive measures to help property developers access to quick funding from Chinese banks.

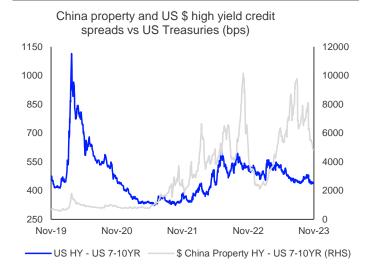


Chart 2: Asian 10s/2s yield curves flattened, in both EM and DM markets, tracking renewed inversion in the US curve. Long yields fell on lower inflation and hopes that rate rises are complete.

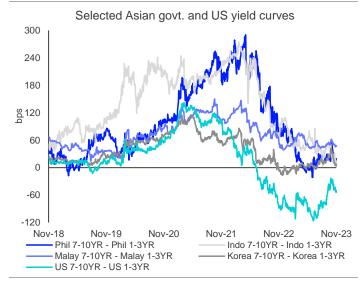


Chart 4: Movements of Asian 7-10yr spreads versus the US were mixed in November, including both increases in India and Malaysia, and decreases in Philippines and Korea.

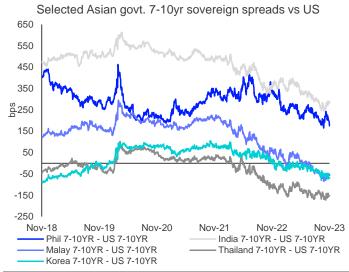
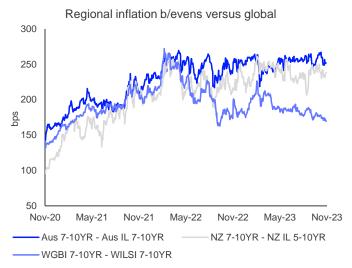


Chart 6: Australasian breakevens have decoupled from lower global breakevens, as regional inflation has persisted above target. The RBA raised the policy rate by 25bps in November to fight inflation.



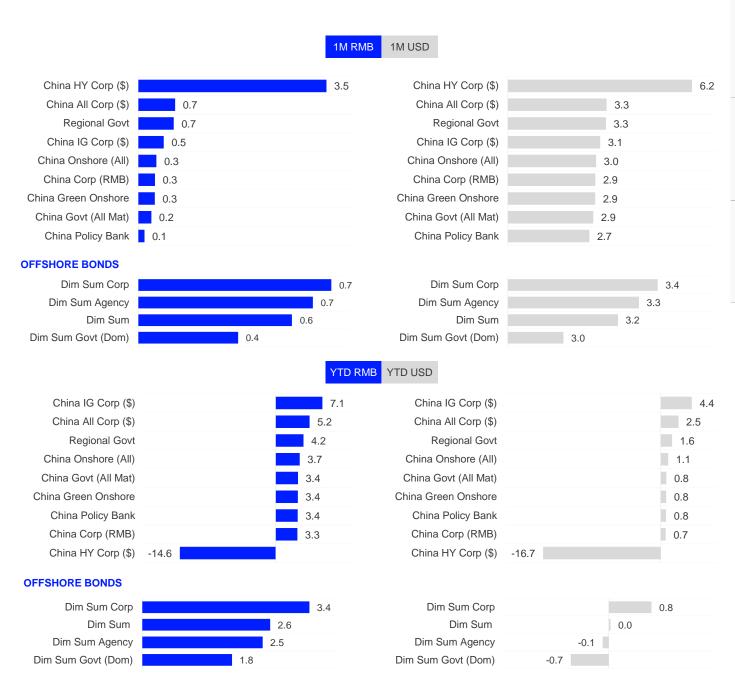
China Bond Market Returns – 1M & YTD in RMB & USD (TR) as of November 30, 2023

Chinese regional government bonds were up 0.7% in November, outperforming onshore peers, while policy banks and sovereigns lagged. Onshore bond returns of 2.7-3.3% in USD terms were largely driven by a stronger RMB vs the US dollar in November. Chinese \$ HY credits rose 6.2%, but IG credits remained top YTD performers after November's gains of 3.1%.

Chinese regional government bonds led gains in November, returning 0.7% in RMB terms. Policy banks and sovereign bonds underperformed, after additional sovereign bond supply in Q4 this year. A stronger RMB boosted domestic bonds returns to 2.7-3.3% in US dollar terms. Onshore bond YTD returns in USD terms became a positive 0.7-1.6%, helped by the November rally.

DimSum bonds outperformed onshore peers in November, posting returns of up to 0.7% and 3.4% in RMB and USD, respectively. Corporates outperformed on 1M and YTD, with slower growth in bond issuance than sovereigns in 2023.

Chinese \$ HY corporates gained 6.2% in November, as property bonds rallied on potential supportive measures from regulators. But weaker data on property sales, housing prices, and investments suggest a near term recovery is unlikely. Chinese \$ IG credits extended their YTD gains to 4.4%, largely helped by returns of 3.1% in November.



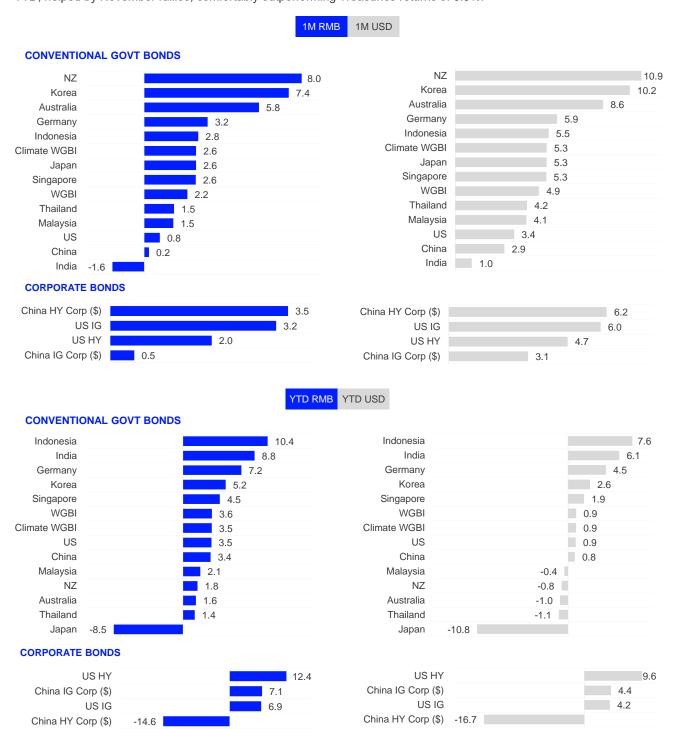
Global Bond Market Returns – 1M & YTD RMB & USD (TR) as of November 30, 2023

Developed Asian government bonds led gains in RMB and USD terms in November, driven by lower yields and stronger currencies vs the US dollar. Most Emerging Asian bonds also joined the November bond rally. Chinese \$ HY corporates recovered some YTD losses, although falling sales and investments in property indicate weak demand continues.

Australasian and Korean government bonds topped November returns, led by New Zealand. Stronger currencies versus the US dollar boosted returns by up to 10.9% in USD terms, with the Australian dollar spiking to a 3-month high after the RBA raised rates to fight persistent inflation. YTD losses in USD terms were largely reversed by November rallies, except in Japan (down by 10.8%).

Emerging Asian bonds delivered positive returns of up to 5.5%, driven by both lower yields and currency effects. Indian bonds lagged, with losses of 1.6% in RMB terms, but Indonesian and Indian bonds remain top performers YTD, gaining 6-10%, largely due to resilient currencies. Chinese bond returns in dollar were reduced to 0.8% by a weaker RMB, from 3.4% in RMB terms.

Chinese \$ HY corporates rallied in November, up by 6.2%, as anticipation of support measures for developers boosted optimism in the sector. US HY gained 4.7% over the month, adding to YTD returns of 9.6%. US and Chinese IG corporates gained 4.2-4.4% YTD, helped by November rallies, comfortably outperforming Treasuries returns of 0.9%.



Top 15% Bottom 15%

Green highlight indicates highest 15%, red indicates lowest 15%.

		1	M	3	М	61	М	12	2M
		USD	RMB	USD	RMB	USD	RMB	USD	RMB
US	1-3YR	1.01	-1.57	1.35	-0.86	1.61	1.99	3.34	3.16
	7-10YR	4.52	1.84	-0.68	-2.85	-3.26	-2.90	-1.51	-1.68
	20+YR	9.97	7.15	-4.27	-6.36	-9.41	-9.07	-7.69	-7.84
	IG All	5.95	3.24	1.25	-0.96	1.23	1.60	3.76	3.58
	HY All	4.66	1.98	2.08	-0.15	5.67	6.06	8.78	8.60
China	1-3YR	2.65	0.02	2.31	0.07	0.41	0.78	2.51	2.34
	7-10YR	2.93	0.30	2.33	0.09	1.31	1.69	4.74	4.57
	20+YR	3.86	1.20	1.39	-0.83	3.11	3.50	9.12	8.94
	All	2.87	0.24	2.18	-0.05	1.00	1.38	4.08	3.90
China Policy Ba	ank	2.74	0.11	2.26	0.03	0.97	1.35	3.91	3.73
Regional Govt		3.30	0.65	1.89	-0.33	1.11	1.49	4.47	4.29
China Corp (LC	·	2.94	0.31	2.42	0.18	0.78	1.16	3.37	3.20
China Onshore	(AII)	2.97	0.33	2.15	-0.08	1.04	1.41	4.14	3.97
China Green O		2.94	0.30	2.45	0.21	0.80	1.18	3.43	3.26
China All Corp	(-)	3.32	0.68	2.04	-0.19	0.67	1.04	4.76	4.58
China IG Corp	,	3.11	0.47	1.74	-0.49	1.16	1.54	5.54	5.36
China HY Corp		6.19	3.48	6.06	3.74	-4.68	-4.32	-2.91	-3.08
Offshore Govt (I		3.02	0.38	1.83	-0.39	0.75	1.13	1.56	1.39
Asia-Pac	1-3YR	3.37	0.72	2.37	0.14	1.25	1.62	3.13	2.96
	7-10YR 20+YR	5.24 8.40	2.55 5.62	1.95	-0.28	0.83 3.29	1.21	4.25 8.20	4.07
	All	4.92	2.23	3.13 2.27	0.88	1.24	3.68 1.61	4.35	8.02 4.17
Australia	1-3YR	5.78	3.08	2.89	0.64	3.23	3.61	0.50	0.33
Australia	7-10YR	9.21	6.42	0.60	-1.59	-1.42	-1.05	-3.54	-3.70
	20+YR	15.99	13.02	-2.02	-4.16	-6.09	-5.74	-10.73	-10.88
	All	8.62	5.84	1.29	-0.92	-0.16	0.21	-2.58	-2.75
India	1-3YR	0.61	-1.96	0.94	-1.27	2.16	2.54	4.30	4.12
iiidid	7-10YR	1.08	-1.50	0.23	-1.96	1.01	1.38	4.74	4.57
	20+YR	0.95	-1.64	-0.45	-2.62	-0.41	-0.04	4.49	4.31
	All	0.96	-1.62	0.22	-1.97	0.89	1.27	4.67	4.49
Indonesia	1-3YR	3.89	1.23	-0.90	-3.07	-1.94	-1.58	7.26	7.08
	7-10YR	5.94	3.23	-2.10	-4.24	-1.90	-1.53	10.20	10.01
	20+YR	5.76	3.06	-2.88	-5.01	-1.44	-1.07	12.71	12.52
	All	5.45	2.75	-1.95	-4.10	-2.01	-1.64	9.96	9.77
Japan	1-3YR	2.62	0.00	-1.50	-3.65	-5.59	-5.24	-5.63	-5.78
	7-10YR	4.77	2.09	-1.50	-3.66	-6.67	-6.32	-6.73	-6.88
	20+YR	7.23	4.48	-2.94	-5.06	-13.55	-13.23	-8.91	-9.07
	All	5.33	2.64	-1.92	-4.07	-8.82	-8.48	-7.21	-7.37
Korea	1-3YR	5.78	3.07	3.72	1.45	4.73	5.12	6.29	6.11
	7-10YR	9.55	6.75	4.43	2.15	3.81	4.20	5.92	5.74
	20+YR	15.34	12.39	6.93	4.59	6.36	6.76	8.95	8.77
BA-1	All	10.18	7.36	5.08	2.78	4.96	5.35	7.04	6.86
Malaysia	1-3YR	2.82 4.08	0.19	0.40	-1.80	-0.09	1.04	-0.55 1.41	-0.72 1.24
	7-10YR		1.42		-1.98		0.29		
	20+YR All	5.68 4.15	2.97 1.48	0.10	-2.08 -1.86	-0.93 0.15	-0.56 0.52	3.22 1.29	3.04 1.12
New Zealand	1-3YR	7.52	4.76	5.50	3.20	4.61	5.00	2.83	2.65
New Zealand	7-10YR	12.01	9.14	5.03	2.74	0.79	1.17	-1.88	-2.05
	20+YR	17.46	14.46	4.59	2.30	-5.20	-4.84	-9.43	-9.58
	All	10.86	8.02	5.25	2.95	1.71	2.09	-0.67	-0.84
Singapore	1-3YR	3.45	0.81	2.32	0.08	3.18	3.56	5.63	5.45
3 p	7-10YR	6.38	3.66	3.75	1.48	2.80	3.19	7.44	7.26
	20+YR	6.43	3.71	3.08	0.83	-8.79	-8.45	2.41	2.24
	All	5.32	2.62	3.04	0.79	0.55	0.92	5.73	5.56
Thailand	1-3YR	2.59	-0.04	-0.08	-2.26	-0.48	-0.11	1.21	1.04
	7-10YR	4.55	1.88	-0.89	-3.05	-3.01	-2.64	1.06	0.89
	20+YR	5.86	3.16	-5.82	-7.88	-6.35	-6.00	9.61	9.42
	All	4.19	1.52	-0.85	-3.01	-2.01	-1.64	2.32	2.15

Top 15% Bottom 15% Green highlight indicates highest 15%, red indicates lowest 15%. **Conventional government bonds** Inflation-linked bonds **Inv Grade** High Yld 1-3YR 3-5YR 7-10YR 20+YR 1-5YR 5-10YR 20+YR **All Mat All Mat** 4.82 4.39 4.35 4.63 2.27 5.64 8.47 Current 2.57 2.14 US 4.99 2.50 1.94 2.01 5.65 8.41 3M Ago 4.39 4.12 4.32 6M Ago 4.61 3.65 2.08 5.43 8.84 3.92 3.94 1.52 1.68 1.40 3.97 3.64 3.95 1.76 1.59 5.38 8.80 12M Ago 4.47 Current 4.52 4.16 4.11 4.61 0.62 0.53 1.30 3M Ago 4.63 4.31 0.67 4.91 4.53 1.11 1.12 6M Ago 4.55 4.33 4.10 4.45 1.18 0.54 1.06 12M Ago 3.36 3.22 3.11 3.37 -1.47 -0.50 0.18 -2.08 -0.94 Current 0.00 0.17 0.57 1.63 3M Ago 0.14 1.55 -1.82 -0.02 0.53 -0.76

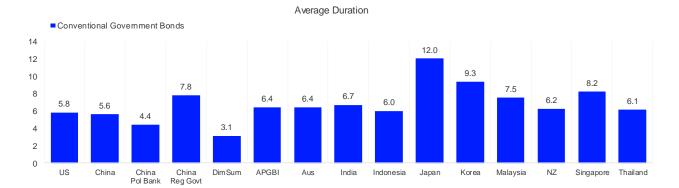
UK Japan 6M Ago -0.08 0.01 0.33 1.22 -1.51 -0.77 -0.04 0.06 0.27 -1.30 -0.66 12M Ago 1.34 2.47 3.02 Current 2.37 2.66 China 2.28 2.59 2.93 3M Ago 2.06 6M Ago 2.36 2.13 2.70 3.14 12M Ago 2.59 2.88 2.26 3.32 3.66 4.22 4.76 4.46 4.42 4.45 5.10 6.08 10.41 Current EM 3M Ago 3.50 4.22 4.80 4.34 2.84 4.28 5.01 6.14 11.41 12.12 6M Ago 3.74 4.16 4.62 4.44 4.34 4.24 5.00 5.78 3.72 4.38 4.60 2.92 3.14 6.08 12.18 12M Ago 5.28 Current 2.86 2.41 2.37 2.67 1.16 0.34 0.28 Germany 3M Ago 3.03 2.53 2.38 2.55 0.64 0.13 0.11 6M Ago 2.71 2.30 2.20 2.40 0.37 -0.04 -0.13 12M Ago 2.04 2.44 2.44 2.39 0.31 0.23 0.02 2.15 3.40 3.93 4.59 1.60 1.97 Current 3.39 Italy 3.53 3M Ago 3.56 3.87 4.41 1.37 1.72 1.86 6M Ago 3.35 3.42 3.89 4.43 1.11 1.62 1.80 12M Ago 2.73 3.48 4.07 4.43 1.14 1.98 2.00 Current 3.01 2.73 2.87 3.46 0.84 0.63 0.95 France 3M Ago 3.09 2.85 2.87 3.36 0.48 0.37 0.71 0.20 0.53 6M Ago 2.83 2.63 2.68 3.24 0.22 12M Ago 2.25 2.53 2.55 2.89 0.28 0.24 0.44 Current 3.27 2.70 2.61 1.30 1.12 Sweden 3M Ago 3.43 3.00 2.75 1.33 1.14 0.74 0.55 6M Ago 2.97 2.62 2.31 2.18 1.89 -0.30 -0.06 12M Ago 2.52 1.81 4.04 4.36 1.28 2.19 Current 4.15 4.73 **Australia** 3.75 3.99 4.42 0.97 1.43 1.84 3M Ago 3.85 6M Ago 3.51 3.38 3.58 4.12 0.42 1.03 1.59 3.10 3.41 3.90 0.26 0.87 1.30 12M Ago 3.12 4.78 4.89 5.09 Current 5.07 1.91 2.59 NZ 3M Ago 5.30 4.96 4.89 5.07 2.15 2.58 6M Ago 5.08 4.35 4.28 4.46 1.23 1.85 12M Ago 4.67 4.12 4.05 4.35 1.24 1.76 Current 4.08 3.58 3.43 1.76 5.29 7.73 Canada 7.70 1.88 3M Ago 4.50 3.65 3.44 5.55 1.44 4.04 3.22 3.18 7.61 6M Ago 5.24 3.70 2.96 1.20 5.07 12M Ago 3.02 7.37

Appendix - Duration and Market Value (USD, Bn), November 30, 2023

Conventional Government Bonds								
		Durat	ion		Market Value			
	3-5YR	7-10YR	20+YR	Overall	3-5YR	7-10YR	20+YR	Total
US	3.7	7.3	16.7	5.8	2,428.2	1,102.6	1,219.7	10,559.2
China	3.7	7.5	17.6	5.6	548.0	387.3	262.8	2,307.4
China Pol Bank				4.4				2,820.7
China Reg Govt				7.8				2,258.2
DimSum				3.1				10.7
APGBI	3.7	7.3	17.9	6.4	804.9	721.6	518.1	4,009.1
Aus	3.6	7.5	16.7	6.4	36.9	86.3	19.8	327.5
India	3.1	6.0	11.6	6.7	130.7	184.7	258.4	1,098.7
Indonesia	3.4	6.1	11.4	6.0	30.9	54.7	11.3	223.5
Japan	3.9	8.0	23.7	12.0	354.7	348.3	632.9	2,951.4
Korea	3.5	6.9	18.9	9.3	86.7	95.9	184.4	639.6
Malaysia	3.5	7.0	15.1	7.5	22.3	13.8	14.8	115.1
NZ	3.7	7.5	16.8	6.2	10.4	14.5	2.5	52.5
Singapore	3.4	7.7	20.2	8.2	20.8	14.7	16.5	96.2
Thailand	3.5	7.3	16.5	6.1	30.1	29.2	6.1	138.7

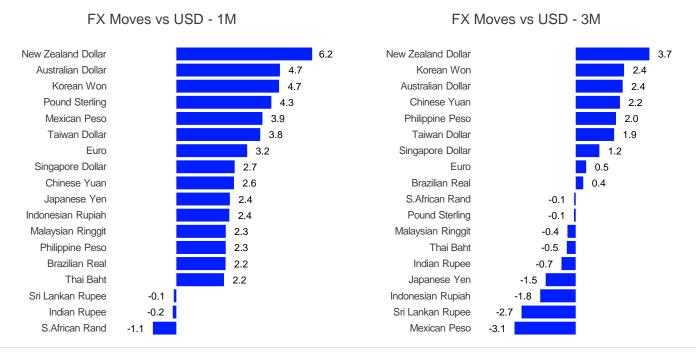
Corporate Bonds						
		Duration			Market Value	
	Inv Grade	High Yield	Overall	Inv Grade	High Yield	Overall
US	6.9	3.9		6,432.7	1,040.2	
China Corp (LC)			2.2			569.6
China Green Onshore			2.2			151.0
China Corp (\$)	3.9	2.2	7.8	233.9	18.0	251.9
DimSum			2.1			13.0
EM	4.9	3.3	4.5	567.5	182.7	750.3
EUxUK	4.4	3.0		2,893.8	427.9	

Other Sectors						
		Duration			Market Value	
	Supra	Agency	Corp NR	Supra	Agency	Corp NR
Offshore (DimSum)	2.0	2.4		1.6	7.0	



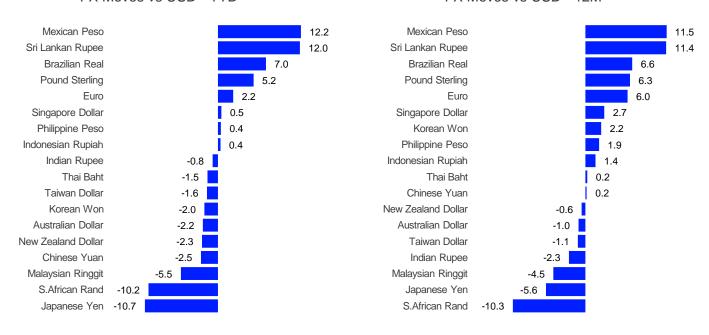


Data as of 2023-11-30





FX Moves vs USD - 12M



Bond markets are based on the following Indices:

FTSE World Government Bond Index (WGBI) for all global government bond markets

FTSE World Inflation-Linked Securities Index (WorldILSI) for all global inflation-linked bond markets

FTSE US Broad Investment-Grade Bond Index (USBIG®) for the US corporate bond market

FTSE US High-Yield Market Index for the US high yield bond market

FTSE Euro Broad Investment-Grade Bond Index (EuroBIG®) for the Euro-denominated corporate bond market

FTSE European High-Yield Market Index for the European high yield market

FTSE Chinese Government and Policy Bank Bond Index (CNGPBI) for the Chinese government bond market

FTSE Emerging Markets Inflation-Linked Securities Index (EMILSI) for the emerging markets inflation-linked bond market

FTSE Emerging Markets Government Bond Index (EMGBI) for the emerging markets government bond market. Please note that over 50% of this index is invested in China.

FTSE Emerging Markets Broad Bond Index (EMUSDBBI) for the emerging markets corporate bond market

List of Abbreviations used in charts:

IL = Inflation-linked bonds

IG = Investment-grade bonds

HY = High-yield bonds

BPS = Basis points

EM = Emerging market

LC = Local currency

Source: FTSE Russell. All data as of November 30, 2023. Past performance is no guarantee of future results. Please see the end for important legal disclosures. For professional investors only.

Global Investment Research Market Maps



ABOUT FTSE RUSSELL

FTSE Russell is a leading global provider of index and benchmark solutions, spanning diverse asset classes and investment objectives. As a trusted investment partner we help investors make better-informed investment decisions, manage risk, and seize opportunities.

Market participants look to us for our expertise in developing and managing global index solutions across asset classes. Asset owners, asset managers, ETF providers and investment banks choose FTSE Russell solutions to benchmark their investment performance and create investment funds, ETFs, structured products, and index-based derivatives. Our clients use our solutions for asset allocation, investment strategy analysis and risk management, and value us for our robust governance process and operational integrity.

For over 35 years we have been at the forefront of driving change for the investor, always innovating to shape the next generation of benchmarks and investment solutions that open up new opportunities for the global investment community.

CONTACT US

To learn more, visit lseg.com/ftse-russell; email info@ftserussell.com; or call your regional Client Service team office:

EMEA +44 (0) 20 7866 1810

Asia-Pacific

North America +1 877 503 6437

Hong Kong +852 2164 3333 Tokyo +81 3 6441 1430 Sydney +61 (0) 2 7228 5659

© 2023 London Stock Exchange Group plc and its applicable group undertakings (the "LSE Group"). The LSE Group includes (1) FTSE International Limited ("FTSE"), (2) Frank Russell Company ("Russell"), (3) FTSE Global Debt Capital Markets Inc. and FTSE Global Debt Capital Markets Limited (together, "FTSE Canada"), (4) FTSE Fixed Income Europe Limited ("FTSE FI Europe"), (5) FTSE Fixed Income LLC ("FTSE FI"), (6) The Yield Book Inc ("YB") and (7) Beyond Ratings S.A.S. ("BR"). All rights reserved.

FTSE Russell® is a trading name of FTSE, Russell, FTSE Canada, FTSE FI, FTSE FI Europe, YB and BR. "FTSE®", "Russell®", "FTSE Russell®", "FTSE4Good®", "ICB®", "The Yield Book®", "Beyond Ratings®" and all other trademarks and service marks used herein (whether registered or unregistered) are trademarks and/or service marks owned or licensed by the applicable member of the LSE Group or their respective licensors and are owned, or used under licence, by FTSE, Russell, FTSE Canada, FTSE FI, FTSE FI Europe, YB or BR. FTSE International Limited is authorised and regulated by the Financial Conduct Authority as a benchmark administrator.

All information is provided for information purposes only. All information and data contained in this publication is obtained by the LSE Group, from sources believed by it to be accurate and reliable. Because of the possibility of human and mechanical error as well as other factors, however, such information and data is provided "as is" without warranty of any kind. No member of the LSE Group nor their respective directors, officers, employees, partners or licensors make any claim, prediction, warranty or representation whatsoever, expressly or impliedly, either as to the accuracy, timeliness, completeness, merchantability of any information or of results to be obtained from the use of FTSE Russell products, including but not limited to Indices, data and analytics, or the fitness or suitability of the FTSE Russell products for any particular purpose to which they might be put. Any representation of historical data accessible through FTSE Russell products is provided for information purposes only and is not a reliable indicator of future performance.

No responsibility or liability can be accepted by any member of the LSE Group nor their respective directors, officers, employees, partners or licensors for (a) any loss or damage in whole or in part caused by, resulting from, or relating to any error (negligent or otherwise) or other circumstance involved in procuring, collecting, compiling, interpreting, analysing, editing, transcribing, transmitting, communicating or delivering any such information or data or from use of this document or links to this document or (b) any direct, indirect, special, consequential or incidental damages whatsoever, even if any member of the LSE Group is advised in advance of the possibility of such damages, resulting from the use of, or inability to use, such information.

No member of the LSE Group nor their respective directors, officers, employees, partners or licensors provide investment advice and nothing in this document should be taken as constituting financial or investment advice. No member of the LSE Group nor their respective directors, officers, employees, partners or licensors make any representation regarding the advisability of investing in any asset or whether such investment creates any legal or compliance risks for the investor. A decision to invest in any such asset should not be made in reliance on any information herein. Indices cannot be invested in directly. Inclusion of an asset in an index is not a recommendation to buy, sell or hold that asset nor confirmation that any particular investor may lawfully buy, sell or hold the asset or an index containing the asset. The general information contained in this publication should not be acted upon without obtaining specific legal, tax, and investment advice from a licensed professional.

The information contained in this report should not be considered "research" as defined in recital 28 of the Commission Delegated Directive (EU) 2017/593 of 7 April 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council ("MiFID II") and is provided for no fee.

Past performance is no guarantee of future results. Charts and graphs are provided for illustrative purposes only. Index returns shown may not represent the results of the actual trading of investable assets. Certain returns shown may reflect back-tested performance. All performance presented prior to the index inception date is back-tested performance. Back-tested performance is not actual performance, but is hypothetical. The back-test calculations are based on the same methodology that was in effect when the index was officially launched. However, back-tested data may reflect the application of the index methodology with the benefit of hindsight, and the historic calculations of an index may change from month to month based on revisions to the underlying economic data used in the calculation of the index.

This document may contain forward-looking assessments. These are based upon a number of assumptions concerning future conditions that ultimately may prove to be inaccurate. Such forward-looking assessments are subject to risks and uncertainties and may be affected by various factors that may cause actual results to differ materially. No member of the LSE Group nor their licensors assume any duty to and do not undertake to update forward-looking assessments.

No part of this information may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the applicable member of the LSE Group. Use and distribution of the LSE Group data requires a licence from FTSE, Russell, FTSE Canada, FTSE FI, FTSE FI Europe, YB, BR and/or their respective licensors.

Refinitiv content is the intellectual property of Refinitiv. Any copying, republication or redistribution of Refinitiv content, including by caching, framing or similar means, is expressly prohibited without the prior written consent of Refinitiv. Refinitiv is not liable for any errors or delays in content, or for any actions taken in reliance on any content.