

## How to hit the curveball

By Warren Lovely & Taylor Schleich

The knuckleball. The sinker. The sweeper. Even the good ol' heater (or fastball). When thrown with sufficient malice, all can frustrate batters. But the curveball surely remains one of the more difficult baseball pitches to handle. And so it is in bond markets, where a shifting yield curve can unsettle investors, necessitating no little adjustment.

Here, we offer a detailed study of past and current US yield curve dynamics, with a clear focus on curve 'steepeners' (which looks to remain the prevailing market condition). Looking back more than a quarter-century we identify nine 'major' yield curve steepeners, which can be further subdivided into two-dozen 'mini' steepening episodes.

Note: As per Chart 1, we identify/label major curve steepeners from 'A' through 'I' while mini steepening episodes are numbered '1' through '24'. So 'I-24' is not only a midwestern interstate highway but also the label attached to the latest (and ongoing) steepening period. Depending on your perspective, the current steepening trend was initiated as early as March 2023 ('I') or as recently as this June ('24').

More than simply comparing/contrasting US yield curve moves, we aim to answer a question put to us frequently: 'What impact should a steeper Treasury curve really have on high-grade credit curves?' Not all that surprisingly, the answer to this (and a host of related queries)

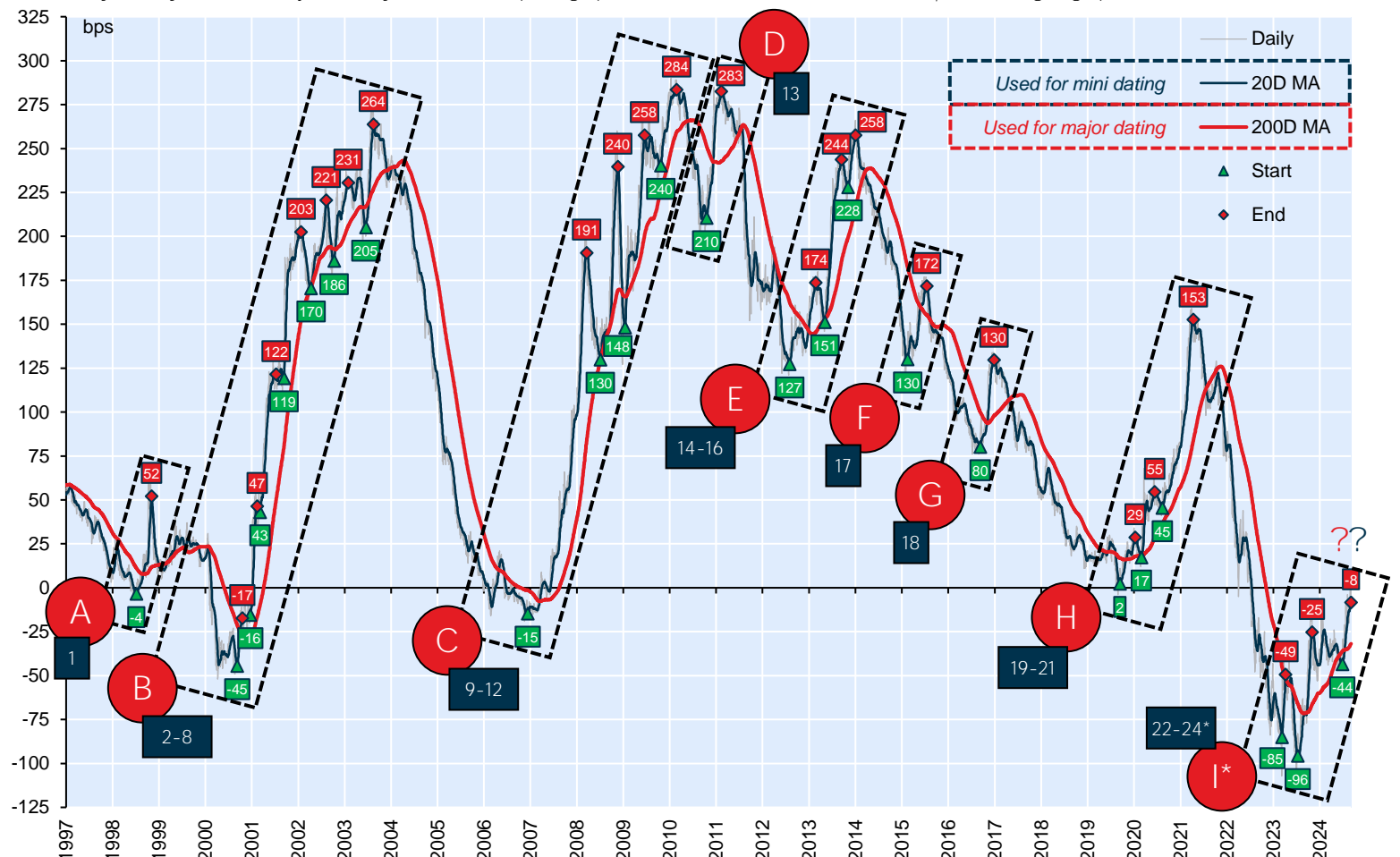
is nuanced. While hard-and-fast rules can be elusive, we present a collection of 'stylized facts' (or at least common tendencies) attached to yield curve steepeners. We likewise provide some perspective/context on current curvature, in both rates and credit.

Some additional notes before diving in... In authoring this study, we focused on the US Treasury market and US investment-grade corporate bonds. Our corporate credit focus was, in part, a byproduct of data availability/richness/quality/frequency. A corporate credit orientation need not invalidate findings for lower-beta/higher-rated credits/sectors, however. The cut and thrust of our primary findings should, in large measure, extend variously to SSAs, sub-national governments and other public-sector credits. Moreover, while keying on the US market, many key findings can be expected to apply to Canada's domestic bond market. Indeed, it may be appropriate to follow up with a more Canada-centric study, quantifying curve tendencies in the highly liquid and actively issued provi/Crown/PSE sectors. An opportunity for further analysis then.

Finally... If, having digested the following report, readers find themselves unsated we would welcome the opportunity for a detailed follow-on discussion.

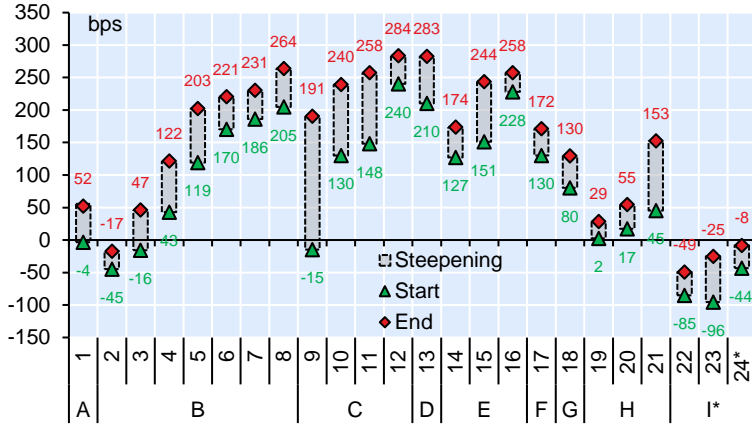
Chart 1: **Setting the stage... two dozen US yield curve steepening episodes in past quarter century**

US Treasury 2-10Y yield curve: Major & mini yield curve steepening episodes identified/labeled/numbered | Latest/ongoing episode: 'I-24'



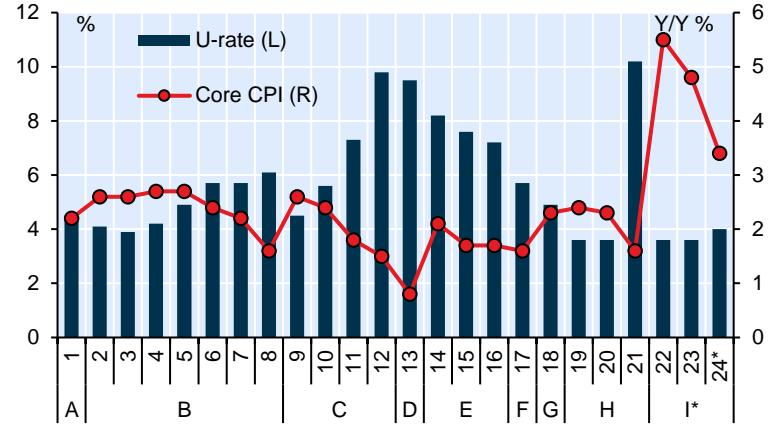
Source: NBF, Federal Reserve Economic Data, St. Louis Fed (FRED), Bloomberg (BBG) | Note: Based on daily UST benchmark yields from 1-Jan-97 to 3-Sep-24 (>7,200 obs); major curve steepeners based on 200D moving avg (red line) labeled 'A-I'; mini curve steepeners based on 20D moving avg (blue line) numbered '1-24'; current/ongoing steepener is 'I-24'

Chart 2: No two steepeners alike? (Start, end, magnitude vary)  
UST 2-10Y yield curve at start/end of major/mini steepening episodes



Source: NBF, FRED, BBG | Note: Start/end of steepening based on 20D mov avg

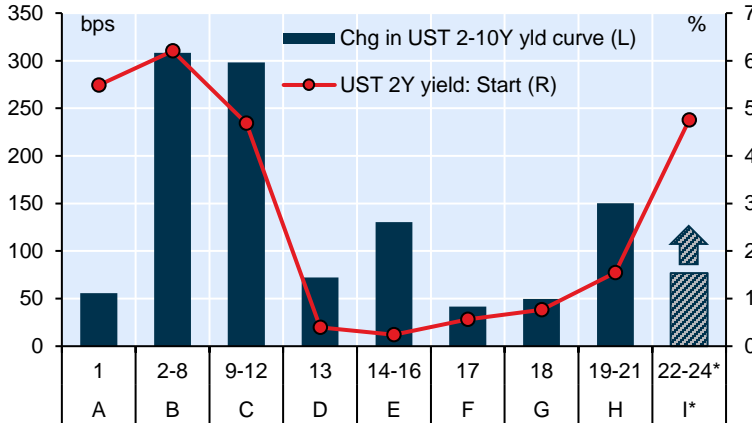
Chart 3: Underlying economic condition have likewise varied  
US unemployment & inflation rate at onset of major/mini steepening episodes



Source: NBF, BBG | Note: Based on rate one month prior to start of steepening

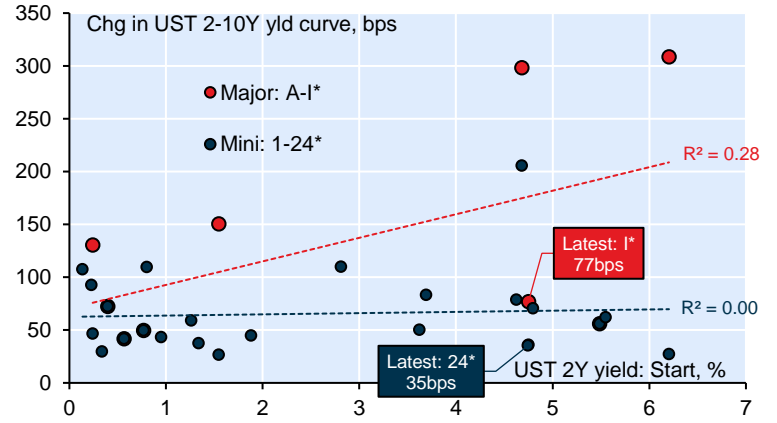
Key takeaway(s): Empirical analysis has its merits... and its limitations. In examining past and current yield curve steepeners there's much to control for (including underlying economic and financial market conditions). While a tad trite, it may be that 'no two curve steepeners are alike'. But that won't stop us from presenting a number of key findings / recommendations. Read on...

Chart 4: Extent of steepening a fcn of starting yield (duh)  
UST 2-10Y curve steepening vs. starting 2Y yield level: Steepening episodes



Source: NBF, FRED, BBG

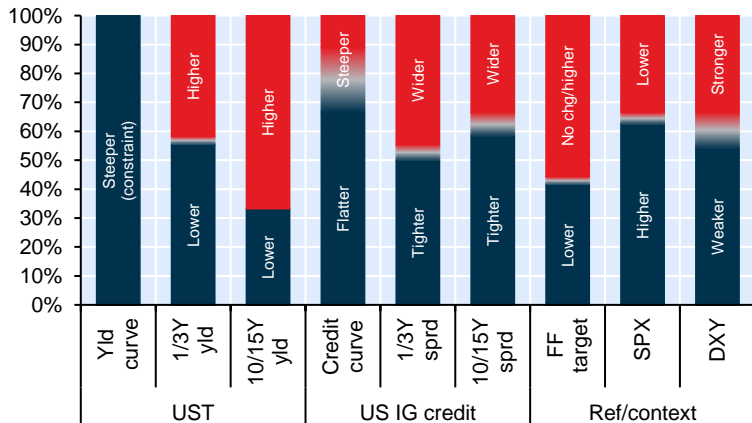
Chart 5: Current yield curve steepener has room yet to run  
UST 2-10Y curve steepening vs. starting 2Y yield level: Steepening episodes



Source: NBF, FRED, BBG

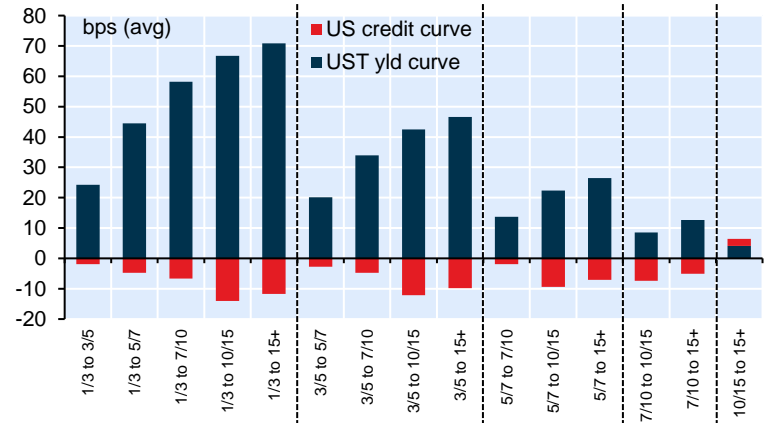
Key takeaway(s): While hardly controversial, the scope for yield curve steepening is partly a function of how rich or cheap rates are to start. Elevated shorter-term yields, like we had in the wake of the FOMC's 2022-23 tightening cycle, create more room to steepen (all else equal). To us, the US 2-10Y yield curve still has roughly 40 bps of steepening to go (over the coming year).

Chart 6: Searching for 'stylized facts' (or common tendencies)  
Observed outcomes during UST yield curve steepening episodes



Source: NBF, FRED, BBG | Note: Based on 9 major/24 mini yield curve steepening episodes from 1997-2024; reflects share of time tendency observed during steepening window

Chart 7: Steeper yield curve → flatter credit curve (a loose 5:1 rule)  
Change in UST yield curves & US IG corp credit curves: Steepening episodes

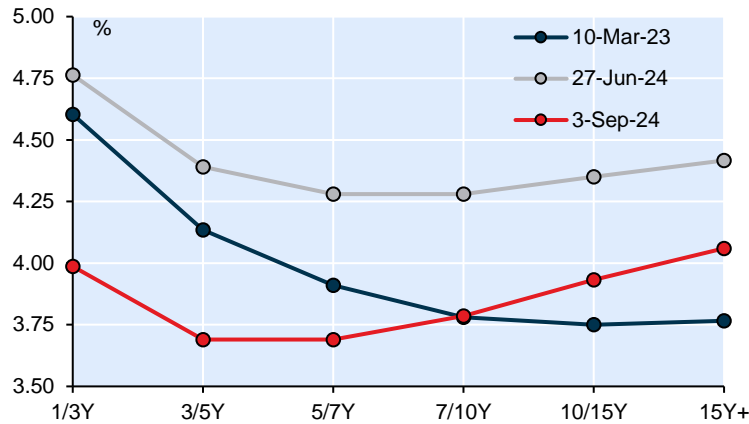


Source: NBF, FRED, BBG | Note: Reflects average change in yield curves/credit curves based on 24 mini yield curve steepening episodes earlier identified (see Chart 1)

Key takeaway(s): On common tendencies, pure 'bull steepeners' are hardly the rule. Two-thirds of the time, a steeper tilt captures/includes higher longer-term yields. The anticipation of fed easing is often sufficient to initiate a steepening trend, as has been the case of late. Flatter credit curves are generally (though not always) observed, credit spreads often supported during such periods, consistent with gains in key risk proxies (like equities). In some instances, a loose 5:1 rule on curves emerges: each 5 bp steepening of a UST curve may key a 1 bp flattening in a credit curve.

**Chart 8: No little amount of adjustment to yield curve...**

UST yield curve: Latest vs start of latest steepening episodes ('1-24')

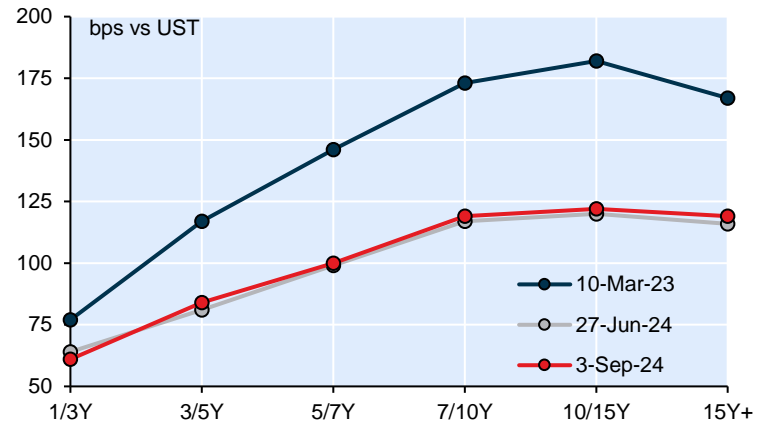


Source: NBF, FRED, BBG

**Key takeaway(s):** Relative to the commencement of the latest major steepening trend back in March 2023, Treasury yields are universally lower while IG corporate credit spreads have compressed notably. Of note, the most recent bout of steepening (ie since late June 2024) has left spreads little changed, as labour market/recession fears mounted and issuers steered new supply to market.

**Chart 9: ... but credit curve reaction blunted of late**

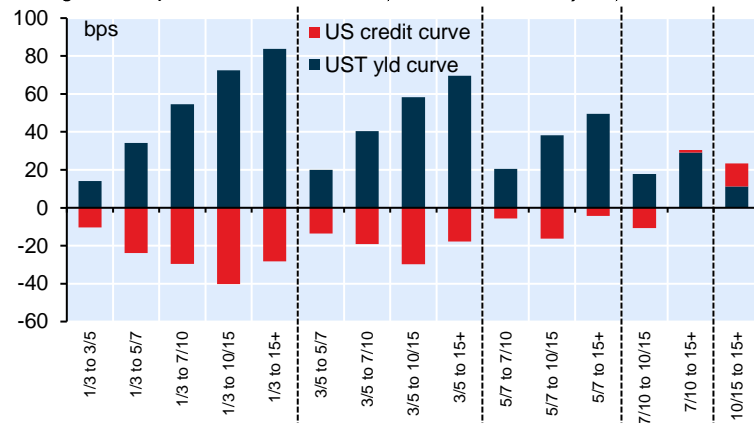
US IG corp credit curve: Latest vs start of latest steepening episodes ('1-24')



Source: NBF, FRED, BBG

**Chart 10: A look at latest major curve steepener (episode '1')...**

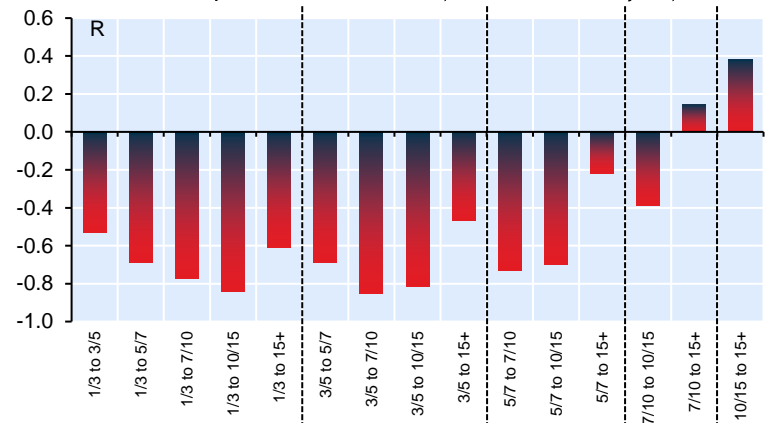
Change in UST yield curves & US IG corp credit curves: Major episode '1'



Source: NBF, FRED, BBG | Note: Refers to period from 10-Mar-23 to 3-Sep-24

**Chart 11: ... where yield-credit curves inversely correlated**

Correlation btw UST yield curves & US IG corp credit curves: Major episode '1'

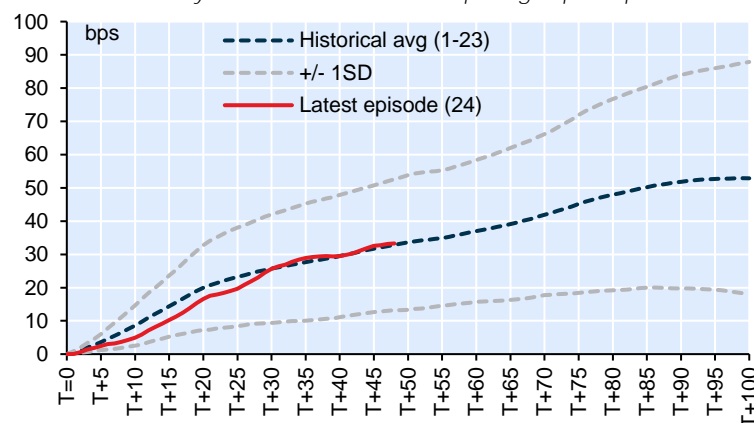


Source: NBF, FRED, BBG | Note: Refers to period from 10-Mar-23 to 3-Sep-24

**Key takeaway(s):** Running the clock back to March 2023, when the latest steepening trend first appeared, the interplay between yield curves and credit curves seems to fit with the empirical record. That is, steeper yield curves have coincided with flatter credit curves in almost all cases (the very long end a bit unique). But these observed (negative) correlations mask a more recent disconnect...

**Chart 12: On yield curve, latest 'mini' episode not abnormal...**

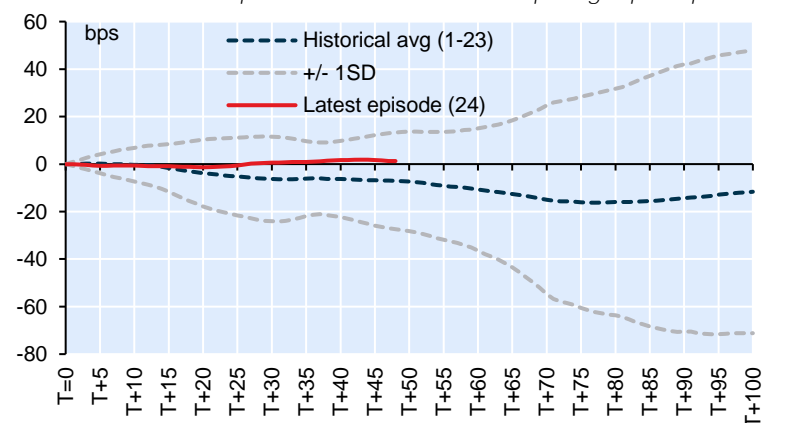
UST 1/3Y to 10/15Y yield curve: Latest mini steepening vs prior episodes



Source: NBF, FRED, BBG | Note: Avg cumulative chg in yield curve during 24 steepening episodes since 1997; latest episode ('24') commenced 27-Jun-24

**Chart 13: ... but credit curve flattening has seemingly stalled...**

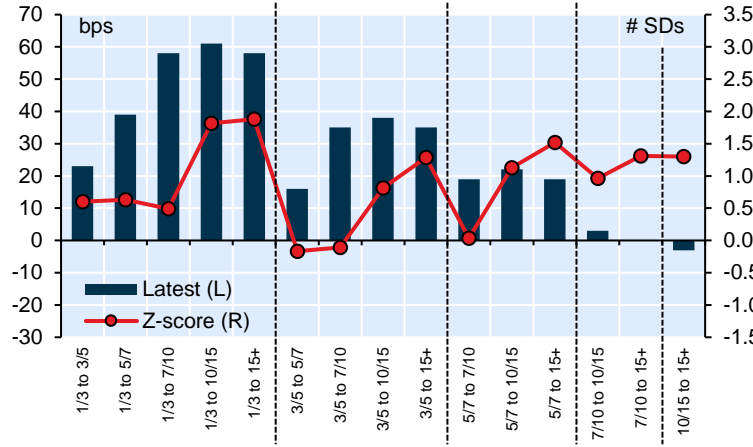
US 1/3Y to 10/15Y IG corp credit curve: Latest mini steepening vs prior episodes



Source: NBF, FRED, BBG | Note: Avg cumulative chg in corp credit curve during 24 UST yield curve steepening episodes since 1997; latest episode ('24') commenced 27-Jun-24

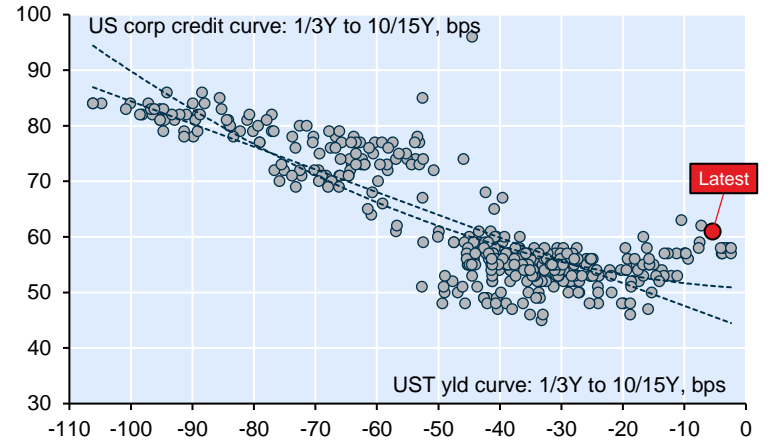
**Key takeaway(s):** More recently, since the latest mini steepener got rolling in late June 2024, the key US 2-10Y yield curve has more or less mimicked a 'normal' steepening trajectory. But the earlier flattening momentum in the corresponding US corporate credit curve has stalled. Mind you, there's a fairly wide confidence band on credit curve arcs, as past results have varied no little bit.

Chart 14: ... leaving current credit curve arguably too steep...  
US IG corp credit curves: Latest levels & 250D Z-scores



Source: NBF, FRED, BBG | Note: Latest refers to 3-Sep-24 closes; Z-scores calculated over latest 250 weekday period (ie roughly 1 year)

Chart 15: 10Y credit statistically 'cheap' on curve? (all else equal)  
UST yield curve vs US IG corp credit curve: Latest major steepening episode



Source: NBF, FRED, BBG | Note: ~390 observations related to latest major yield curve steepening episode (ie episode 'I'), covering 10-Mar-23 to 3-Sep-24 (latest)

**Key takeaway(s):** All else being equal, the current US credit curve retains a degree of steepness that appears out-of-line with the underlying Treasury yield curve. Ten-year credit, for example, registers as cheap on the curve (eg 2-10Y credit curves roughly two standard deviations cheap to the latest 250D trading range). Given the notionally attractive entry point, and in light of our expectation of continued UST yield curve steepening, we could expect some marginal demand to materialize out the curve... a prospect surely not lost on issuers.

Table: A look at **one aspect of NBF's** UST yield curve-credit curve study, isolating for representative maturities/curves  
UST yield curve steepening episodes (major/mini), including US IG corp credit curve reaction & reference variables: Representative curves (1/3Y to 10/15Y)

UST yield curve steepening episodes				UST yield curve (bucketed maturities approach)				US IG corp credit curve (bucketed maturities approach)				Reference/context							
ID	Start	End	Weekdays	UST yield curve: 1/3Y to 10/15Y			1/3Y	10/15Y	US IG corp credit curve: 1/3Y to 10/15Y		1/3Y	10/15Y	SPX	DXY	FF Upper				
Letter/Number	< Dates >		#	Start bps	End bps	Change bps	%	%	Start bps	End bps	Change bps	Spread change bps	Change %-pts	Change %-pts	Change bps				
A	1	7-Jul-98	4-Nov-98	86	7	67	60	0.69	-1.29	-0.69	26	25	-1	-0.01	57	56	-5.8	-7.8	-44
B	2-8	8-Sep-00	15-Aug-03	765	-37	285	322	0.42	-4.45	-1.23	72	29	-44	-0.06	-33	-76	-34.5	-14.1	-550
C	9-12	11-Dec-06	24-Feb-10	837	-16	302	318	0.38	-3.87	-0.69	57	43	-14	-0.02	112	98	-22.5	-4.6	-500
D	13	19-Oct-10	10-Feb-11	82	232	303	71	0.86	0.27	0.98	75	60	-15	-0.18	-16	-30	12.4	0.0	0
E	14-16	2-Aug-12	1-Jan-14	369	144	271	127	0.34	0.15	1.42	112	97	-15	-0.04	-63	-78	33.4	-3.6	0
F	17	16-Feb-15	15-Jul-15	107	139	184	45	0.42	0.09	0.54	98	104	6	0.05	1	6	2.0	1.6	0
G	18	8-Sep-16	26-Dec-16	77	91	139	48	0.63	0.43	0.91	125	92	-33	-0.43	7	-26	2.8	7.0	11
H	19-21	12-Sep-19	12-Apr-21	412	5	164	160	0.39	-1.41	0.19	110	75	-35	-0.09	-14	-49	36.4	-6.0	-200
I	22-24*	10-Mar-23	3-Sep-24	387	-81	-9	72	0.19	-0.70	0.03	97	57	-40	-0.10	-9	-49	37.4	-2.4	75
A-I	Average	Major UST yield curve steepening episodes		347	54	190	136	0.48	-1.20	0.16	86	65	-21	-0.10	5	-16	6.8	-3.3	-134
	Max			837	232	303	322	0.86	0.43	1.42	125	104	6	0.05	112	98	37.4	7.0	75
	Min			77	-81	-9	45	0.19	-4.45	-1.23	26	25	-44	-0.43	-63	-78	-34.5	-14.1	-550
A	1	7-Jul-98	4-Nov-98	86	7	67	60	0.69	-1.29	-0.69	26	25	-1	-0.01	57	56	-5.8	-7.8	-44
B	2	8-Sep-00	18-Oct-00	28	-37	-9	27	0.97	-0.21	0.06	72	68	-5	-0.16	-1	-5	-6.3	2.5	0
C	3	20-Dec-00	12-Feb-01	38	-13	56	69	1.81	-0.86	-0.17	48	35	-13	-0.34	-8	-21	0.9	-3.3	-73
D	4	6-Mar-01	11-Jul-01	91	54	143	89	0.97	-0.64	0.24	40	59	19	0.21	-33	-14	-5.2	6.3	-164
E	5	11-Sep-01	23-Jan-02	96	135	231	96	1.00	-0.80	0.16	64	46	-18	-0.18	26	9	0.2	2.9	-180
F	6	12-Apr-02	9-Aug-02	85	199	244	45	0.53	-1.20	-0.75	15	33	17	0.23	51	68	-23.3	-9.8	0
G	7	10-Oct-02	28-Jan-03	78	210	253	43	0.55	-0.14	0.28	27	15	-12	-0.15	-75	-87	8.2	-6.0	-50
H	8	17-Jun-03	15-Aug-03	43	227	285	58	1.35	0.45	1.03	26	29	3	0.07	-19	-16	1.4	3.2	-25
I	9	11-Dec-06	18-Mar-08	331	-16	204	219	0.66	-2.93	-0.74	57	-3	-6	-0.18	193	133	-5.2	-12.3	-229
A	10	4-Jul-08	18-Nov-08	97	147	251	104	1.07	-1.33	-0.29	-19	-269	-250	-2.58	497	247	-30.7	17.8	-88
B	11	14-Jan-09	17-Jun-09	110	173	280	107	0.97	0.33	1.40	-178	-68	110	1.00	-289	-179	3.8	-2.2	0
C	12	23-Oct-09	24-Feb-10	88	262	302	41	0.46	-0.06	0.35	-6	43	49	0.55	-87	-38	1.5	5.1	0
D	13	19-Oct-10	10-Feb-11	82	232	303	71	0.86	0.27	0.98	75	60	-15	-0.18	-16	-30	12.4	0.0	0
E	14	2-Aug-12	21-Feb-13	145	144	193	49	0.34	0.03	0.52	112	87	-25	-0.17	-45	-70	11.2	-3.8	0
F	15	6-May-13	12-Sep-13	93	171	257	87	0.93	0.23	1.10	100	94	-6	-0.07	8	2	4.7	-0.9	0
G	16	4-Nov-13	1-Jan-14	42	245	271	26	0.62	0.04	0.30	97	97	-1	-0.02	-10	-11	4.6	0.4	0
H	17	16-Feb-15	15-Jul-15	107	139	184	45	0.42	0.09	0.54	98	104	6	0.05	1	6	2.0	1.6	0
I	18	8-Sep-16	26-Dec-16	77	91	139	48	0.63	0.43	0.91	125	92	-33	-0.43	7	-26	2.8	7.0	11
A	19	12-Sep-19	10-Jan-20	86	5	37	33	0.38	-0.01	0.32	110	97	-13	-0.15	-15	-27	10.3	-1.2	-50
B	20	28-Feb-20	12-Jun-20	75	23	66	43	0.57	-1.16	-0.73	105	109	4	0.06	74	78	-7.0	-0.8	-150
C	21	11-Aug-20	12-Apr-21	174	56	164	108	0.62	0.04	1.13	116	75	-41	-0.24	-25	-66	22.1	-1.9	0
D	22	10-Mar-23	7-Apr-23	20	-81	-52	30	1.49	-0.68	-0.38	97	69	-29	-1.45	40	11	-0.4	-1.6	16
E	23	12-Jul-23	1-Nov-23	80	-95	-23	72	0.90	0.26	0.99	83	54	-28	-0.35	9	-20	-3.1	3.7	25
F	24*	27-Jun-24	3-Sep-24	48	-42	-9	33	0.69	-0.73	-0.40	56	57	1	0.03	3	5	2.1	-3.0	0
A-I	Average	Mini UST yield curve steepening episodes		92	93	160	67	0.81	-0.41	0.26	56	42	-14	-0.19	14	0	0.0	-0.2	-42
	Max			331	262	303	219	1.81	0.45	1.40	125	109	110	1.00	497	247	22.1	17.8	25
	Min			20	-95	-52	26	0.34	-2.93	-0.75	-178	-269	-250	-2.58	-289	-179	-30.7	-12.3	-229

Source: NBF, FRED, BBG | Note: The above table aims to give a flavour of our empirical study; results are drawn from detailed data set of daily (weekday) UST bonds & US investment-grade corporate bonds sourced from the St. Louis Fed & Bloomberg; our available sample ranges from Jan-97 to Sep-24, representing over 7,200 weekday observations; using 20- & 200-day moving averages, mini/major UST yield curve steepening episodes were identified/labelled (refer to Chart 1 for illustration); the above table isolates for these steepening episodes, with separate analysis conducted on stable/flattening yield curve environments; of note, US investment-grade corporate bond yields & spreads to the UST curve are based on a maturity bucket approach (eg 1/3Y, 3/5Y, 5/7Y, 7/10Y, 10/15Y, 15Y+); matching buckets were generated for USTs; in all, 6 maturity buckets were studied, with 15 individual yield curves & credit curves examined; to ease digestibility, the above table presents results for a single representation yield curve-credit curve relationship, that relating to the 1/3Y & 10/15Y maturity buckets; all yield/spread/curve/reference levels & changes are based on 20-day moving average to smooth daily volatility





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