2019 J.P. Morgan Securitized Products Midyear Outlook

CLOs: The Lasting Lender Strikes Back!

June 26, 2019

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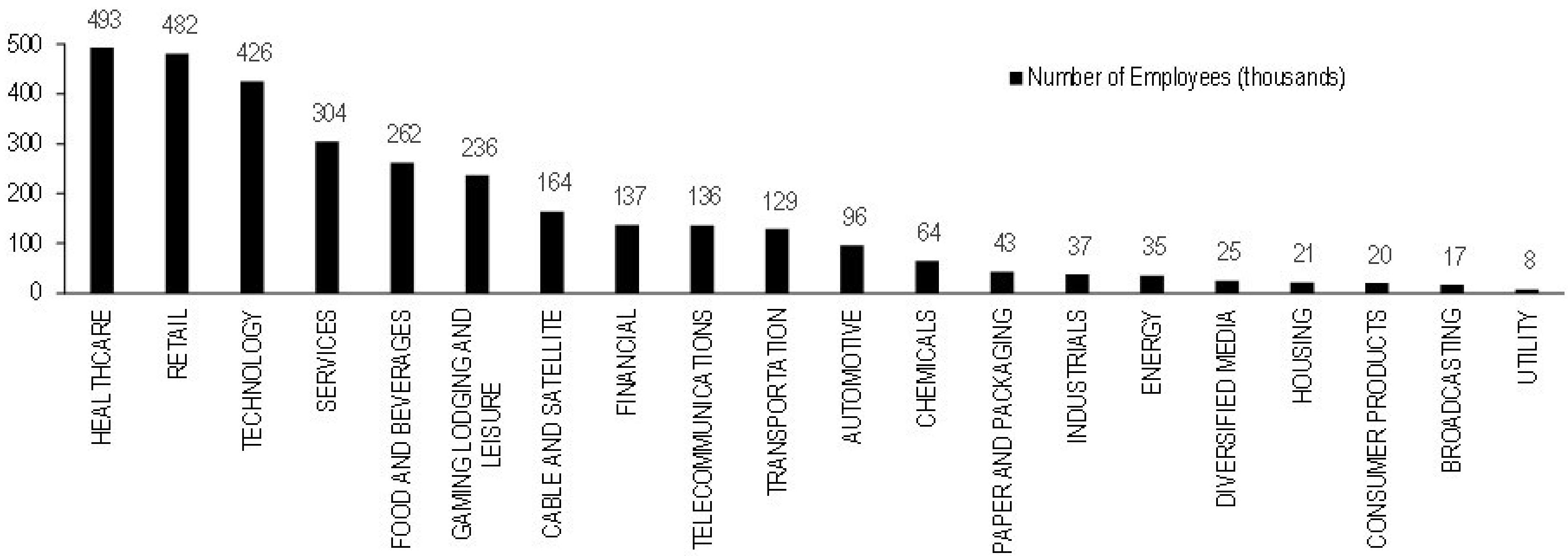
Executive summary

- **The Lasting Lender Strikes Back!** Despite some predictions, YTD US CLO supply is on track towards our $115-125bn forecast
- **CLOs help the real economy** by in part financing 3.1 million jobs across 20 industries… term-financed liquidity is clearly a good thing
- **CLOs are transforming leveraged credit by providing liquidity to loans**; net CLO supply meeting/exceeding net High Yield supply for a second-straight year and CLOs ~65% of YTD net loan supply (moderates to ~53% by yearend)
- As global fixed income is increasingly Japanized with anticipated central bank easing **CLOs offer reasonable yields in this context**
- **Emerging Big Data and AI-type tech is new** but some case studies show promising relevance in CLOs (e.g. automated algo allocation)

Belying the incessantly negative headlines, CLO term-financed liquidity in part supports companies employing some 3.1 million people across 20 industries

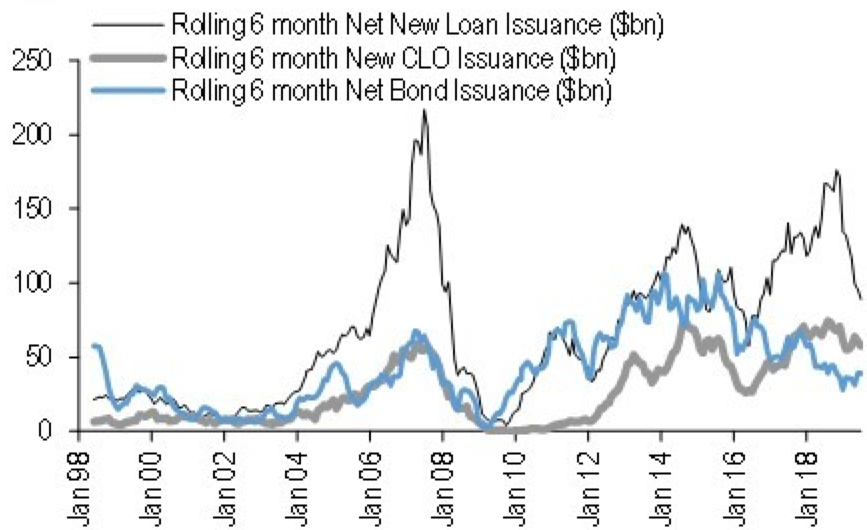
Estimated employment by industry based on US loans financed by CLOs



Source: J.P. Morgan, company reports, Bloomberg. Based on 139 of the current top 200 loans in our US CLO dataset.

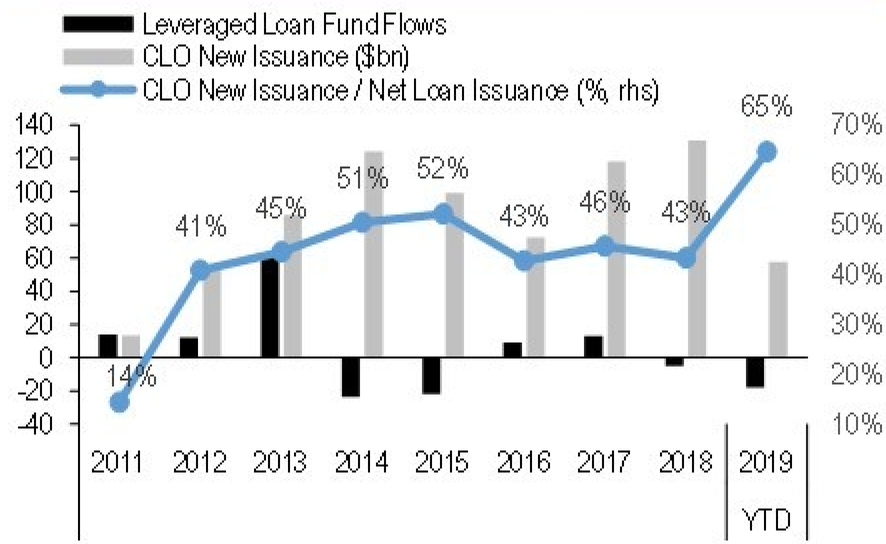
CLOs are playing a transformational role in leveraged credit origination

Rolling 6m CLO, loan and HY net supply



Source: J.P. Morgan

Loan supply/demand technicals

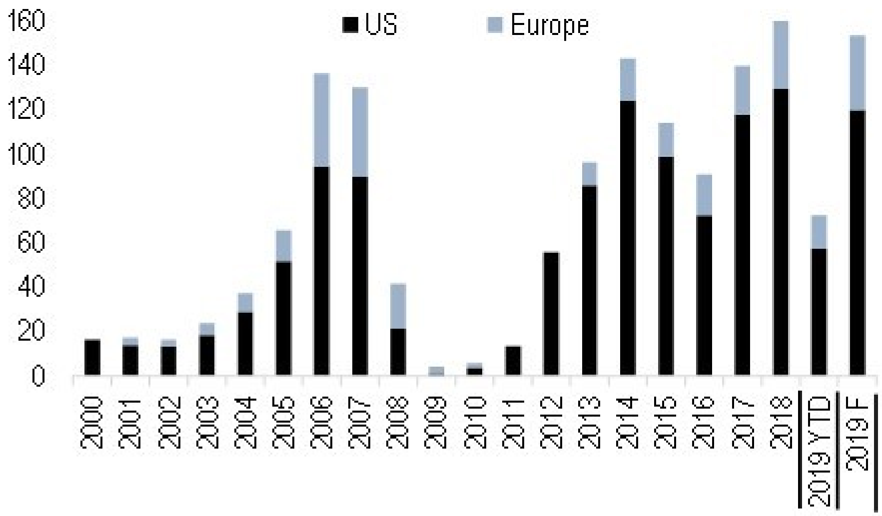


Source: J.P. Morgan. 2019 F represents US CLO Supply forecast midpoint of $120bn and US Net Loan Supply forecast of $225bn.

- CLOs may meet or exceed net High Yield supply for a second-straight year and are playing a role sucking some of the origination out of bonds into loans
- On a rolling 6 month basis, CLO supply ex refi/reset accounts for 65% of net new loan supply (moderates to ~53% by YE19)
- Record-high loan borrowers of 1,344 (497 bond-only issuers, 1,002 loan-only issuers, 342 cross-issuers

Will supply reach our "Street-high" forecast

Annual Global CLO supply ($bn)



Source: J.P. Morgan

Moderate growth in managers now

	2014	2015	2016	2017	2018	2019YTD
First-time US CLO Managers	11	6	7	8	6	4
Total US Managers (New Issue)	100	83	80	94	108	80
Total US New Issue Deal Count	235	191	157	212	243	118
Total US New Issue Notional ($bn)	124.1	99.1	72.4	118.1	129.7	58.6

US New Issue CLO		118
EUR RR-Compliant		16 (13.6%)
Method	Vertical	3 (18.8%)
	Horizontal	13 (81.3%)
	Undisclosed	0 (0.0%)

Source: J.P. Morgan.

- After a record April ($15.6bn) CLO supply is moderating but at ~$60bn on track to our $115-125bn FY forecast
- Fewer US CLOs comply with EU risk retention (mostly mid mkt, some others)
- Manager base growth is moderating

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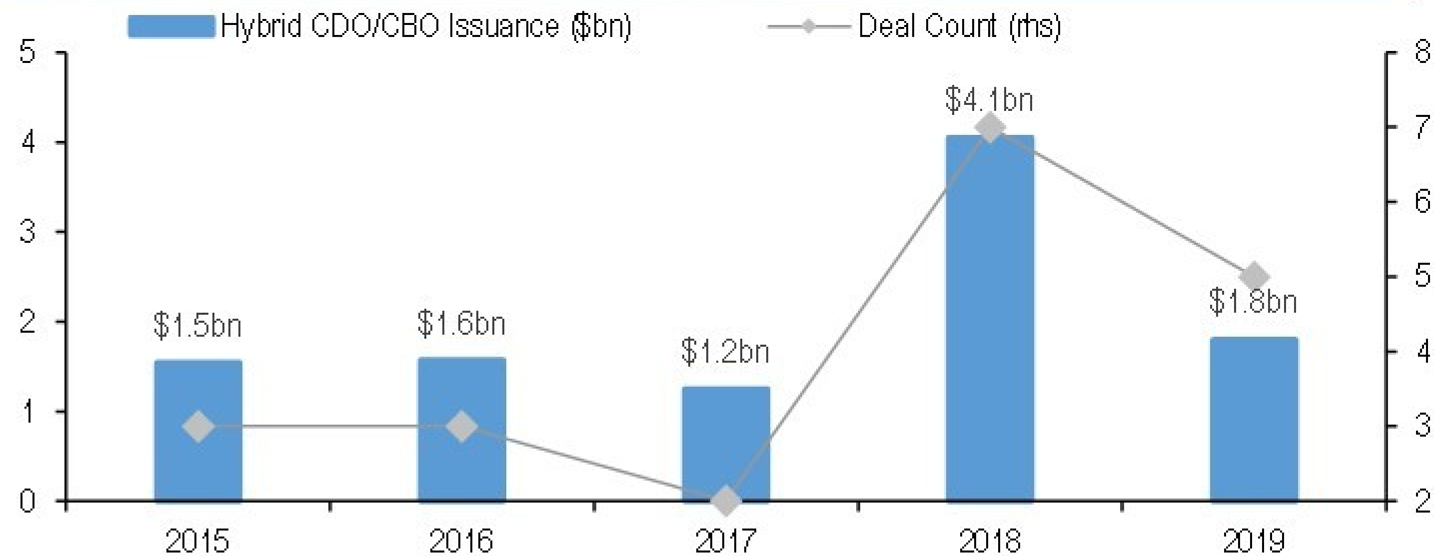
Hybrid bond/loan structures

Hybrid loan/bond securitization in the last 5 years



Source: J.P. Morgan.

- An uptick in hybrid loan/bond structures. YTD, five ($1.8bn) vs 7 ($4.1bn) in FY18
- On average, 72% loans / 28% bonds (doc flexibility to rotate situationally)
- Volcker Rule makes it hard to sell to US banks but demand for fixed-rate tranches as AAA coupons have averaged 4.5% (insurance, real money, etc)
- Lower leveraged compared to CBOs in late 1990s/early 2000s.

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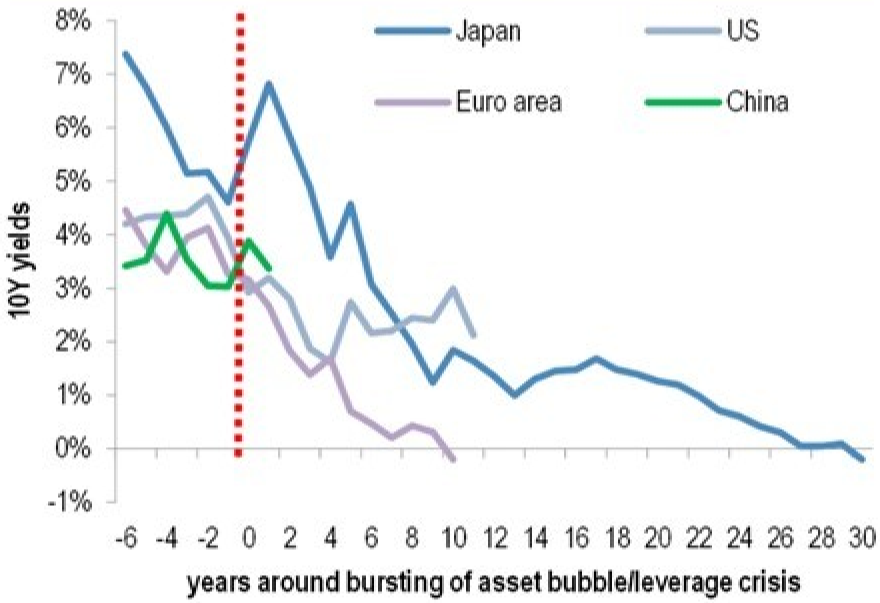
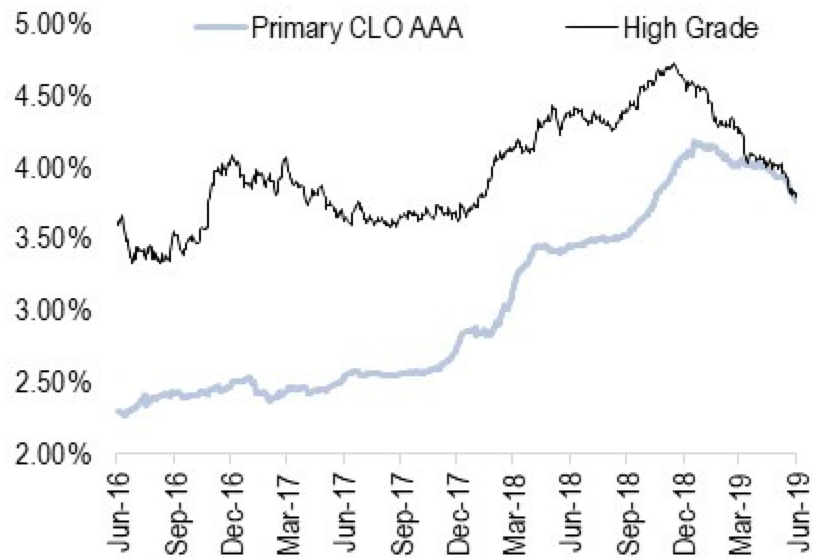
CLO returns have declined but don't seem unreasonable in the broader context (Japanization of global fixed income)

10y yields in the years before/after start of majoring deleveraging events in Japan (1990), US (2008), China (2017)

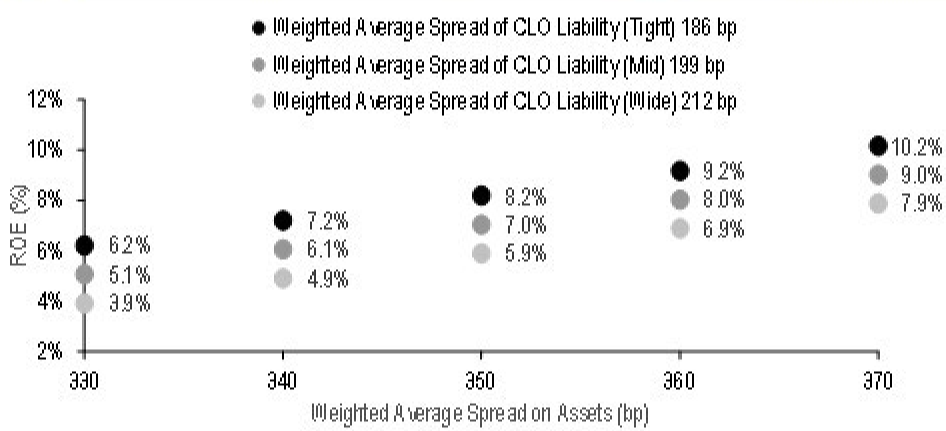


$11.2 trillion negative-yielding debt (highest since 2016)

CLO AAA versus High Grade, Yield



Hypothetical new issue CLO equity ROE



Source for all charts: J.P. Morgan.

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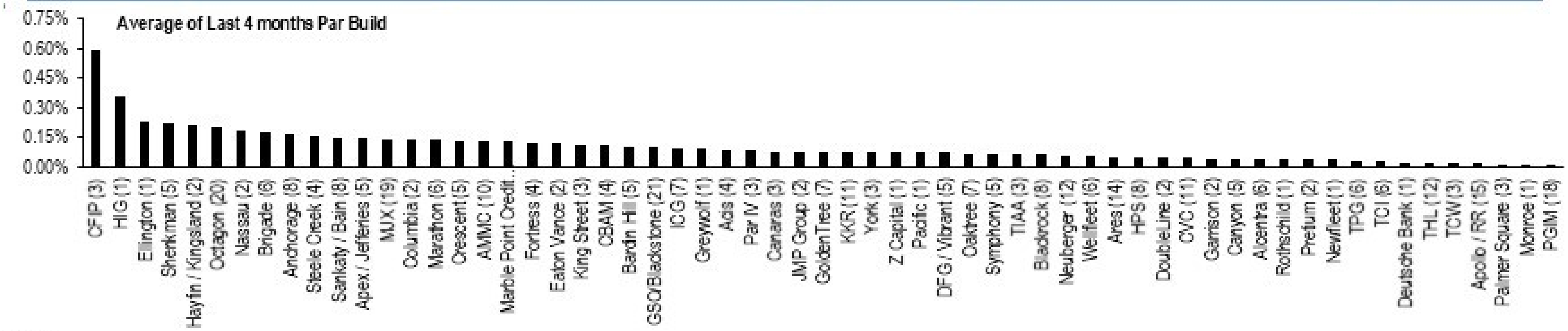
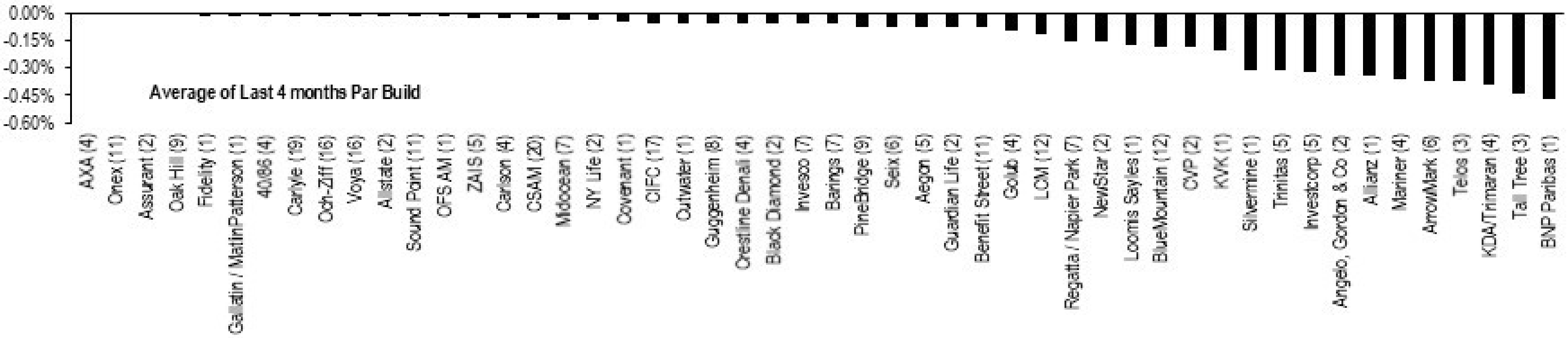
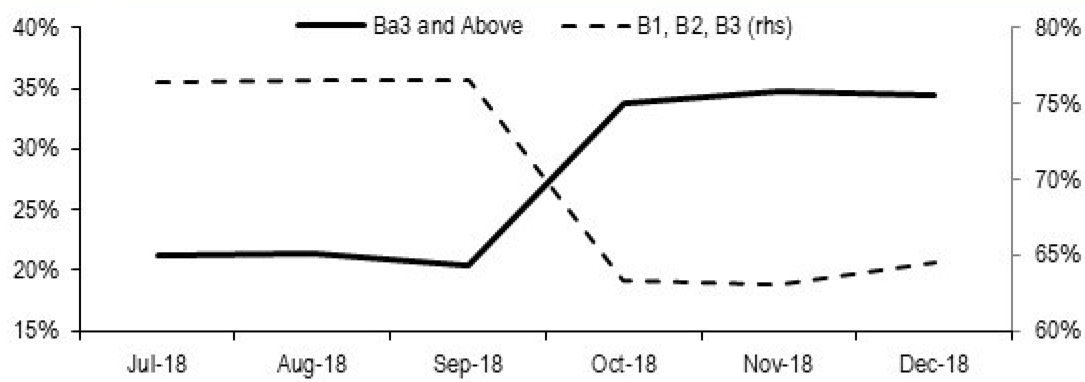
CLOs generally maintained par and improved loan quality during the volatility

Manager par build during loan market volatility/recovery (Oct '18 to end-Jan '19)





Rating distribution of loan purchases



Source for both charts: J.P. Morgan, INTEX.

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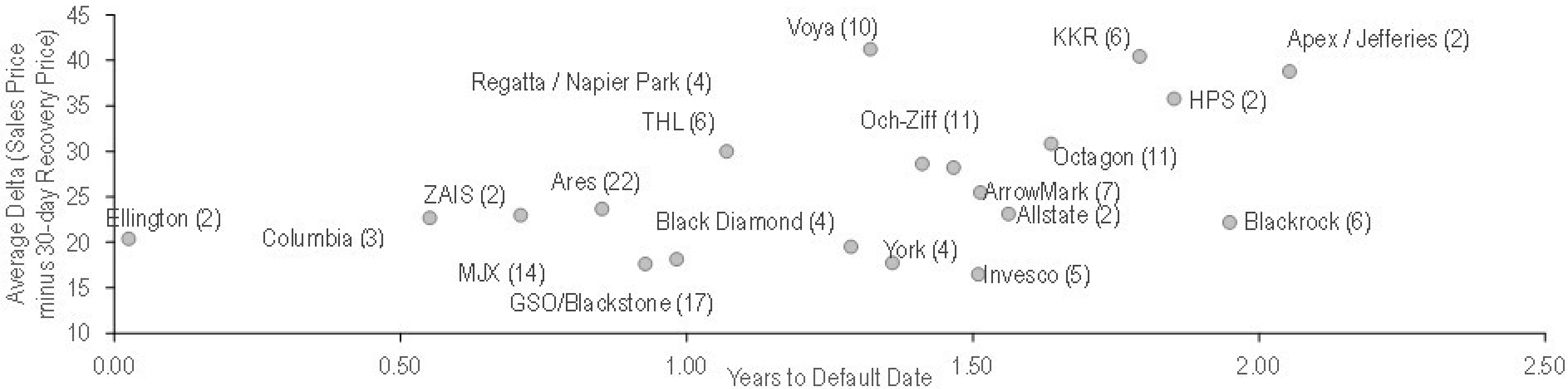
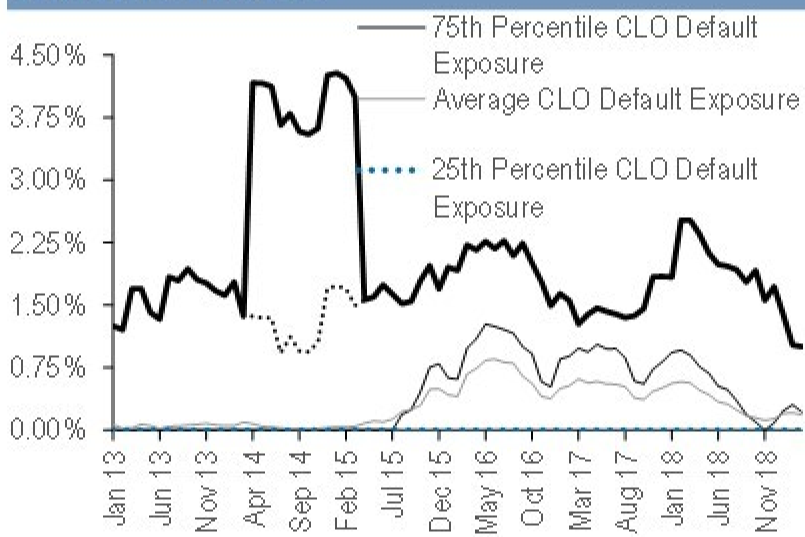
CLO managers tend to sell loan defaults 12-18 months ahead of eventual default

Weighted-Average Sale Price minus Recovery Price versus Weighted-Average Sales Trade Timing for 20 US CLO managers with the highest price delta in our sample



Leveraged loan default rate versus CLO default exposure



- Trades of loans that eventually defaulted account for a small proportion of all CLO sales, but they tend to be early (about half (44%) 12-18 months or longer before the default)
- Sale prices tended to be higher than estimated loan recovery rates 30 days post-default by an average of $16.4.

Source for both charts: J.P. Morgan, INTEX.

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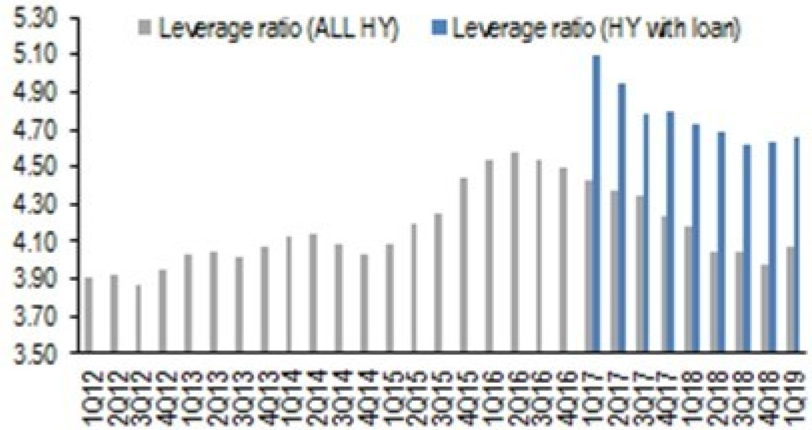
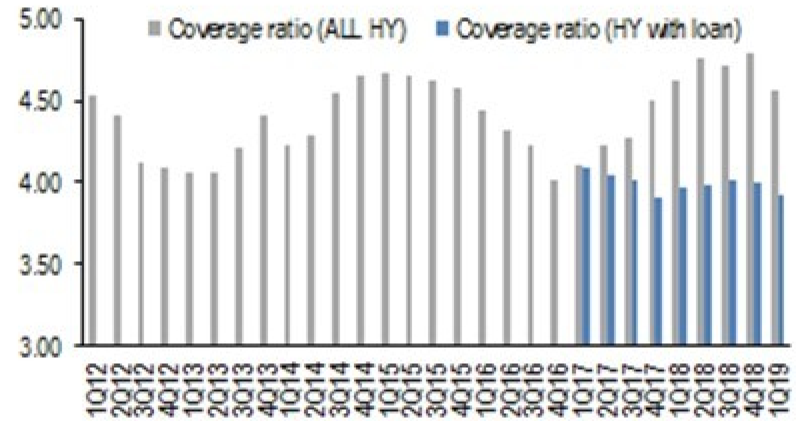
Loan credit fundamentals deteriorated in 19Q1

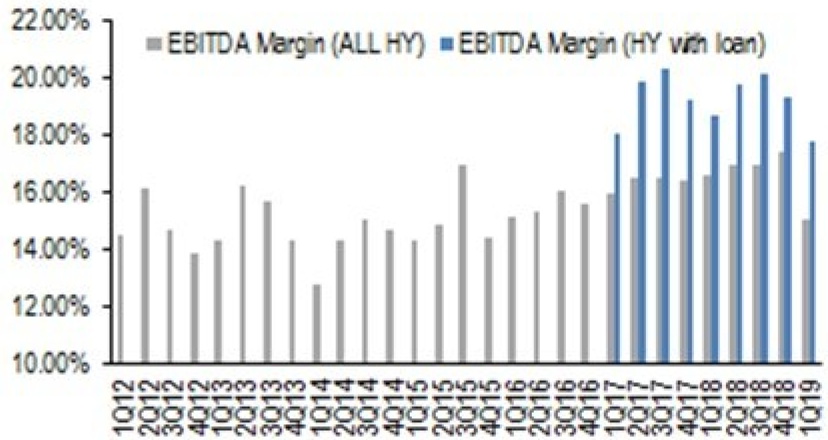
Leverage



Interest coverage



EBITDA margin



Source for all charts: J.P. Morgan. EBITDA margin = EBITDA/Revenue.

- Based on 176 companies (241 loans) in US CLOs
- Most metrics worsened in 19Q1, though EBITDA margin remains double-digits
- Libor dropping with Fed easing partly mitigates falling interest coverage as revenues decline

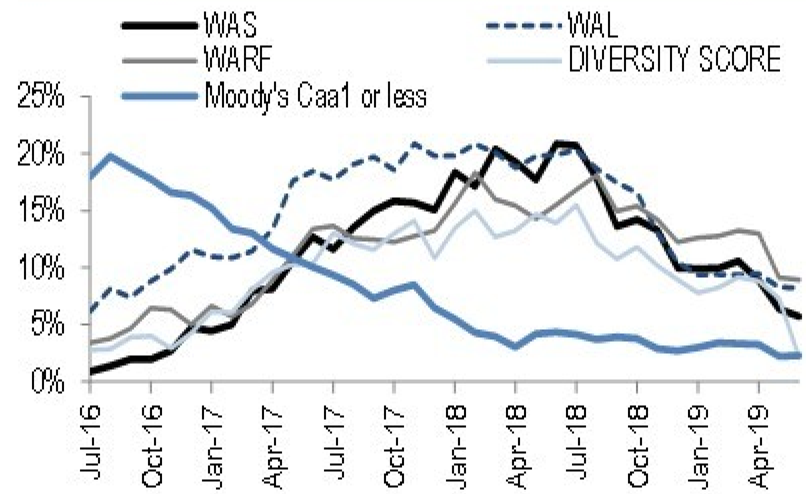
CLO Collateral Performance: Stable to improved

Change in select collateral quality tests for US CLOs over the last 1 year

		Average	Average Limit	Cushion	Count of Failing	% of Failing
WAS	Jun-18	346	334	12	161	21%
	Jun-19	348	321	27	53	6%
	Change	3	-12	15	-108	-15%
WARF	Jun-18	2810	2962	152	117	16%
	Jun-19	2836	3020	184	82	9%
	Change	26	58	32	-35	-7%
Diversity Score	Jun-18	76	68	7	104	14%
	Jun-19	78	68	11	19	2%
	Change	3	-1	3	-85	-12%
WAL	Jun-18	5.07	6.55	1.47	154	20%
	Jun-19	4.92	6.95	2.03	77	8%
	Change	-0.15	0.40	0.55	-77	-12%
Moody's % Caa1 or Less	Jun-18	3.82	7.5	-4	31	4%
	Jun-19	3.64	7.7	-4	20	2%
	Change	-0.2	0.2	0	-11	-2%

Source: J.P. Morgan, INTEX.

Decreasing number of CLOs failing tests



Source: J.P. Morgan, INTEX.

- Weighted Average Spread (WAS) has seen some relief in the last six months
- A decreasing number of CLOs are failing their tests

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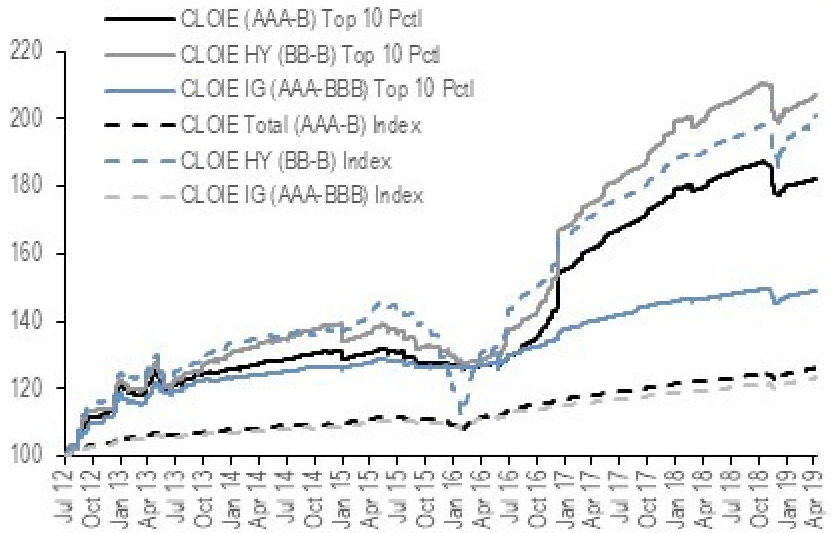
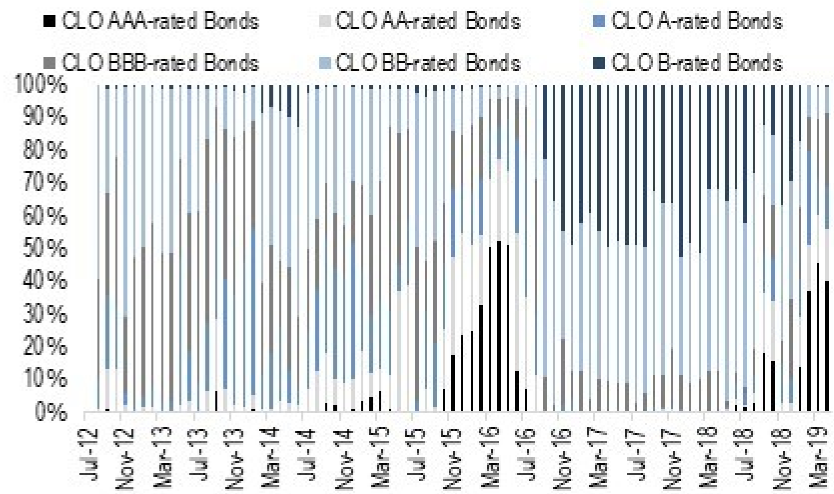
Using automated algos has a future, though AI-type tech is still in its early stages

Algo strategy performance versus CLOIE



Source: J.P. Morgan

Select equal weight, rating unconstrained, Top 10% monthly basket weights by rating



Source: J.P. Morgan

- Factor investing is well-known more broadly but relatively untested in CLOs
- We devised automated algorithms that used price momentum to allocate to bonds within the CLOIE index.
- Initial theoretical results are promising; more work is needed.

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Nervously Bullish

June 26, 2019

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2019 high yield and leveraged loan forecasts

	US High-Yield Bonds					US Leveraged Loans				
	2016	**2017**	**2018**	**YTD**	**2019E**	**2016**	**2017**	**2018**	**YTD**	**2019E**
Total Return	+18.91%	+7.59%	-2.39%	+9.09%	+12.00%	+9.78%	+4.25%	+1.08%	+5.54%	+8.00%
Gross Issuance	$286.2bn	$328.1bn	$187.4bn	$125.1bn	$235bn	$485.4bn	$973.9bn	$703.7bn	$141.4bn	$300bn
Net Issuance	$119.8bn	$120.4bn	$73.3bn	$42.4bn	$115bn	$169.4bn	$258.3bn	$301.7bn	$94.9n	$225bn

	YE '16	**YE '17**	**YE '18**	**18-Jun-19**	**2019E**	**YE '16**	**YE '17**	**YE '18**	**18-Jun-19**	**2019E**
Default rates*	4.28%	1.46%	1.87%	1.44%	1.50%	1.50%	1.88%	1.65%	1.27%	1.50%
Yield	6.47%	6.10%	8.23%	6.61%	6.75%	6.23%	6.31%	8.13%	6.43%	6.50%
Spread	476bp	404bp	567bp	468bp	515bp	458bp	419bp	559bp	464bp	475bp

Source: J.P. Morgan
Note: Loan yields and spreads data are based on 3yr takeout period. High-yield bond yields and spreads are based on US HY Index.

- Includes distressed exchanges
- YTD data as of June 18th, 2019

2019 macro forecasts

J.P. Morgan interest rate forecasts

	Actual (18-Jun-19)	Sep-19	Dec-19	Mar-20	Jun-20
Effective funds target	2.37%	2.15%	1.90%	1.90%	1.90%
3-mo LIBOR	2.39%	2.30%	2.15%	2.05%	2.05%
2-yr US Treasury	1.87%	1.70%	1.40%	1.30%	1.50%
5-yr US Treasury	1.83%	1.70%	1.45%	1.35%	1.55%
10-yr US Treasury	2.06%	1.90%	1.75%	1.65%	1.80%

10-yr Global Gov't Yields	**German**	**Japan**	**France**	**Spain**	**Italy**
	-0.32%	-0.13%	0.01%	0.39%	2.11%

J.P. Morgan crude oil price forecasts ($/bbl)

	Actual (18-Jun-19)	Sep-19	Dec-19	Mar-20	Jun-20
Brent	62.14	67.33	65.33	64.33	62.33
WTI	53.90	58.33	60.00	59.33	57.33

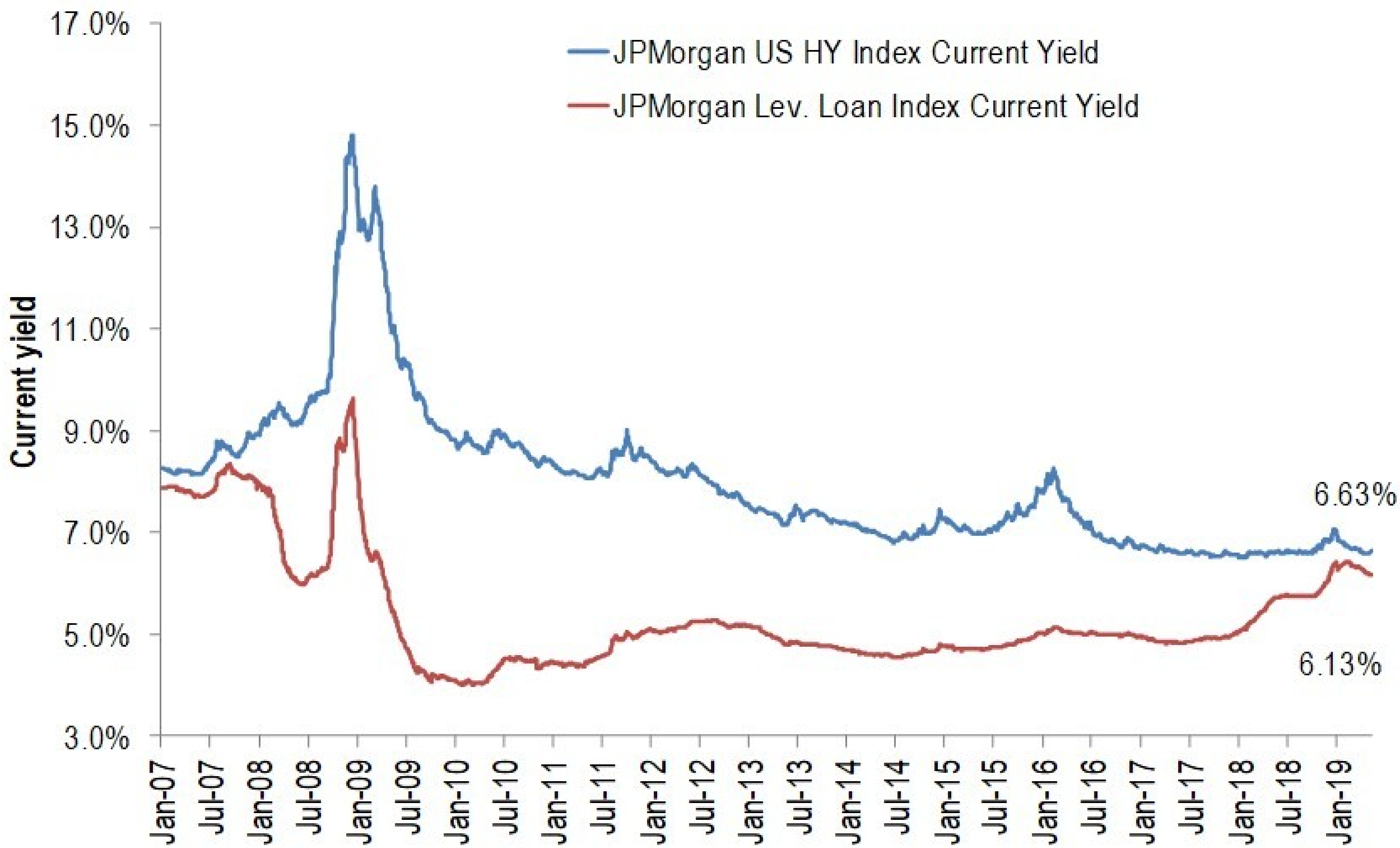
GDP

	% q/q, saar									% y/y			
	1Q18	2Q18	3Q18	4Q18	1Q19	2Q19E	3Q19E	4Q19E	1Q20E	2017	2018	2019E	2020E
United States	2.2	4.2	3.4	2.2	3.1	1.8	1.5	1.8	1.8	2.2	2.9	2.5	1.7
Japan	-0.9	3.0	-2.5	1.8	2.2	0.8	1.0	-2.5	1.5	1.7	0.8	0.8	0.4
China	6.9	6.6	6.0	6.1	6.7	6.1	5.9	5.9	6.1	6.9	6.6	6.3	6.1
Euro area	1.6	1.8	0.6	1.0	1.6	1.3	1.3	1.5	1.8	2.5	1.9	1.2	1.6
EM	5.4	4.3	4.0	3.8	3.9	4.4	4.5	4.5	4.5	5.1	4.7	4.2	4.5

Source: J.P. Morgan

Difference in CYLD between HY and Loans lowest since Nov '07

High-yield bond and leveraged loan current yields



Source: J.P. Morgan

Loan technicals weaken following dovish Fed pivot

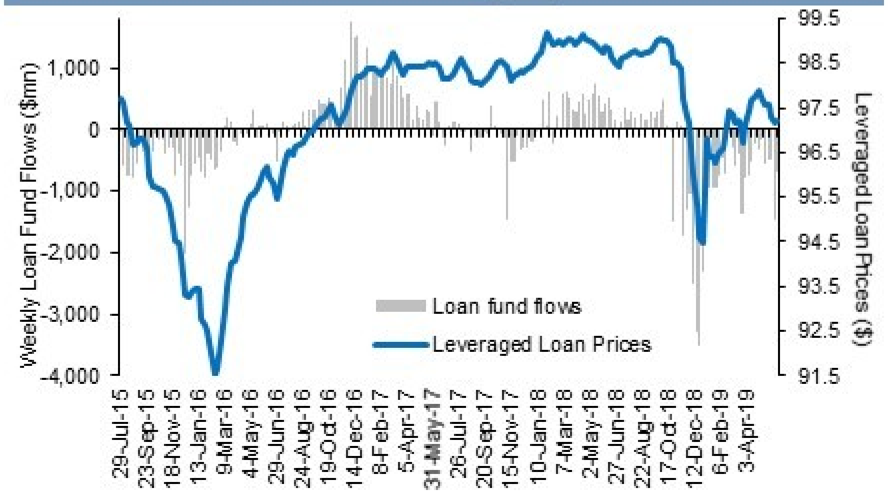
- 54.9% of leveraged loans are trading $99 or higher versus 85% in early October.
- In 2018, gross institutional loan new-issue volume totaled $703.7bn, $253.6bn or 36% was repricing.
- The loan asset class endured record outflows in December totaling $15.3bn. Outflows continue in 2019 totaling $16.1bn.

Loan technicals

($bn)	2012	2013	2014	2015	2016	2017	2018	YTD
Gross new issuance	300.5	669.9	466.9	325.8	485.4	973.9	703.7	141.4
Paydowns*	-199.6	-259.5	-188.2	-175.0	-260.9	-344.8	-241.2	-83.3
Repricings	-37.3	-241.7	-90.5	-63.5	-137.4	-440.3	-253.6	-3.9
Net new issuance	**63.5**	**168.8**	**188.2**	**87.3**	**87.1**	**188.9**	**208.8**	**54.1**
Retail inflows	12.2	63.0	-23.8	-21.7	9.2	13.1	-4.7	-18.9
*CLO issuance	55.7	87.1	124.1	99.5	73.3	117.1	130.6	58.0
Total Demand	**67.9**	**150.0**	**100.3**	**77.8**	**82.5**	**130.2**	**125.9**	**39.2**
Supply surplus/(shortfall)	**-4.4**	**18.8**	**87.9**	**9.5**	**4.6**	**58.7**	**82.9**	**15.0**

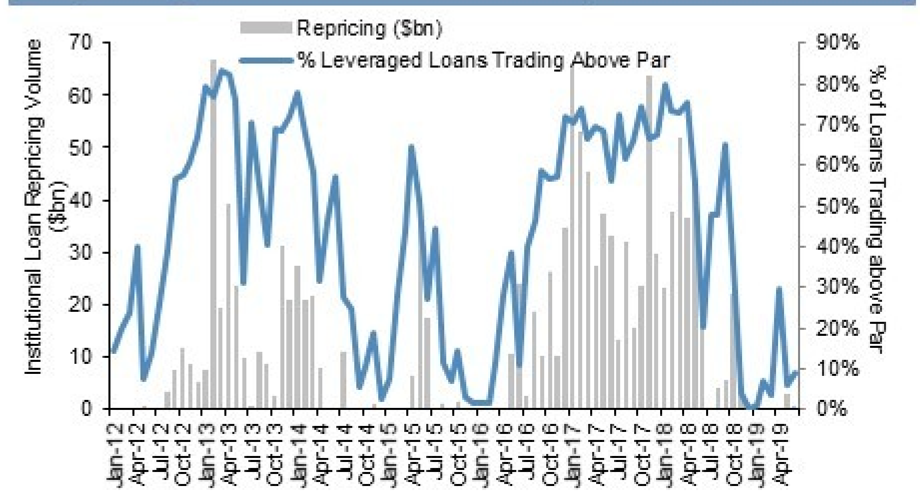
Sources: J.P. Morgan, S&P LCD, *CLO issuance volumes exclude reset and refinance.

Loan fund flows vs average prices



Sources: J.P. Morgan, Markit, Lipper FMI

Repricing volume vs % above par



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High-Yield Bond Supply Shortage continues in 2019

High-yield bond technicals

($bn)	2011	2012	2013	2014	2015	2016	2017	2018	YTD
New issuance	245.6	368.1	398.5	355.7	293.2	286.2	328.1	187.4	125.1
Fallen angels	38.4	26.7	41.2	37.2	143.1	85.6	19.9	47.5	5.0
Total Supply	**284.0**	**394.8**	**439.8**	**392.9**	**436.3**	**371.8**	**348.0**	**234.9**	**130.1**
Calls	73.4	102.1	122.8	137.2	126.3	127.5	176.1	140.4	50.7
Tenders	49.4	50.9	47.2	47.2	49.8	70.6	59.0	43.7	26.7
Maturities	47.4	42.6	48.8	40.1	44.2	50.9	37.5	46.5	31.3
Rising stars	34.7	51.9	83.7	45.9	50.3	23.8	22.2	57.4	31.0
Coupon reinvestment	82.3	83.0	88.3	89.3	93.8	98.2	87.4	82.7	34.8
Mutual fund flows (AMG)	15.6	29.0	-4.7	-23.8	-16.6	9.6	-20.3	-46.9	8.3
Total Demand	**302.8**	**359.5**	**386.2**	**336.0**	**347.7**	**380.7**	**362.0**	**323.7**	**182.9**
Supply surplus/(shortfall)	**-18.8**	**35.2**	**53.6**	**56.9**	**88.6**	**-8.8**	**-14.0**	**-88.8**	**-52.8**

Source: J.P. Morgan

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High-yield implied default rates

HY implied default rate using spread to worst

Spread to worst		Historical Excess Spread		Implied default loss		Par - Recovery		Implied default
468bp	-	300bp	=	168bp	/	(100% - 35%)	=	2.6%

Leveraged loan implied default rate using spread to 3-year

Spread to worst		Historical Excess Spread		Implied default loss		Par - Recovery		Implied default
464bp	-	300bp	=	164bp	/	(100% - 60%)	=	4.1%

Source: J.P. Morgan
Note: Excess spread is the liquidity/volatility/sentiment component of credit spreads. 300bp is the 20yr monthly median of the difference between actual spreads and actual default loss. For bonds, this figure has ranged from -202bp (November 1991) to 1,687bp (November 2008) with standard deviation of 225bp. We like to think of excess spreads as the premium an investor requires to be paid above the expected default loss.

As of June 18th, 2019

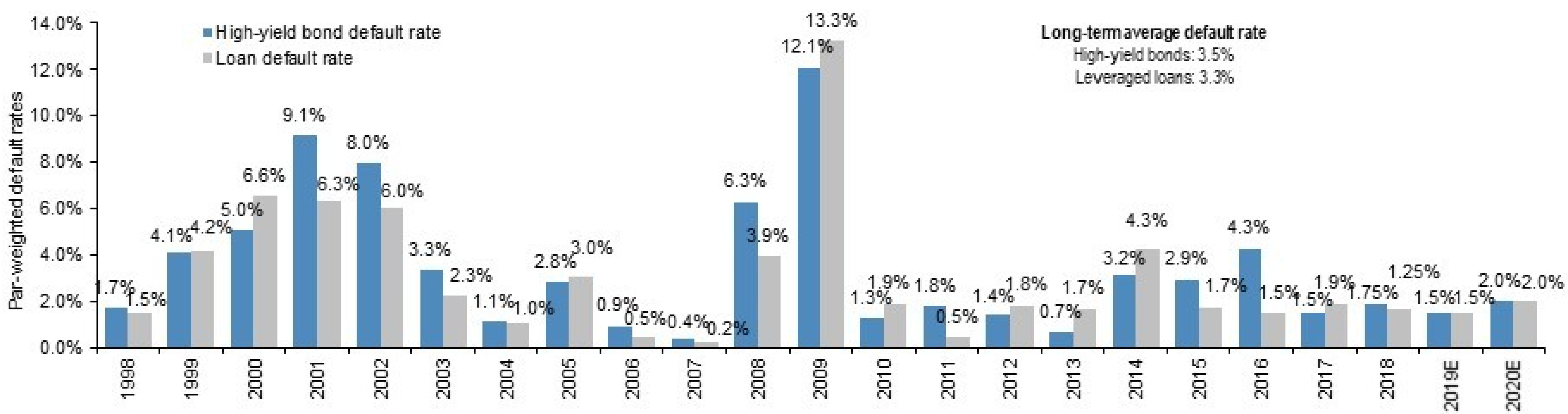
Default rates and recovery rates

- We expect the high-yield bond and loan default rates to come in at 1.50% each in 2019, which remains below the 3.0-3.5% long-term averages.
- We also forecast high-yield bond and loan default rates of 2.0% apiece at year end 2020.

Recovery rates

	Recovery rates						
	All Bonds	Senior Secured	Snr Unsec	Snr Sub	Sub	First-Lien	Second-Lien
2009 Adj.	35.68	42.86	42.98	26.12	4.75	61.36	36.44
2010	40.95	51.85	36.51	22.17	na	71.18	13.33
2011	48.56	63.72	36.22	31.17	7.00	66.97	1.31
2012	53.23	60.45	38.53	10.50	na	55.29	18.33
2013	52.74	59.57	36.47	46.00	1.00	68.62	56.67
2014	48.05	67.74	31.22	33.75	na	73.31	37.67
2015	25.19	32.69	16.60	12.96	na	48.15	34.34
2016	31.13	36.65	23.24	0.50	na	62.69	14.79
2017	52.55	61.62	39.16	na	na	57.45	4.38
2018	39.78	46.33	32.90	18.00	na	63.44	7.83
LTM	**37.60**	**43.16**	**30.53**	**18.00**	**na**	**58.81**	**7.85**
Energy	**31.37**					**55.63**	
M&M	**26.94**					**26.53**	
Ex-En M&M	**38.35**					**62.27**	
LT average	41.37	54.62	39.12	29.33	29.33	66.35	23.03

Historical default rates and forecasts



Source: J.P. Morgan
Note: Excluding two-to-three capital structures, we forecast default rates to be 1.50% in 2019

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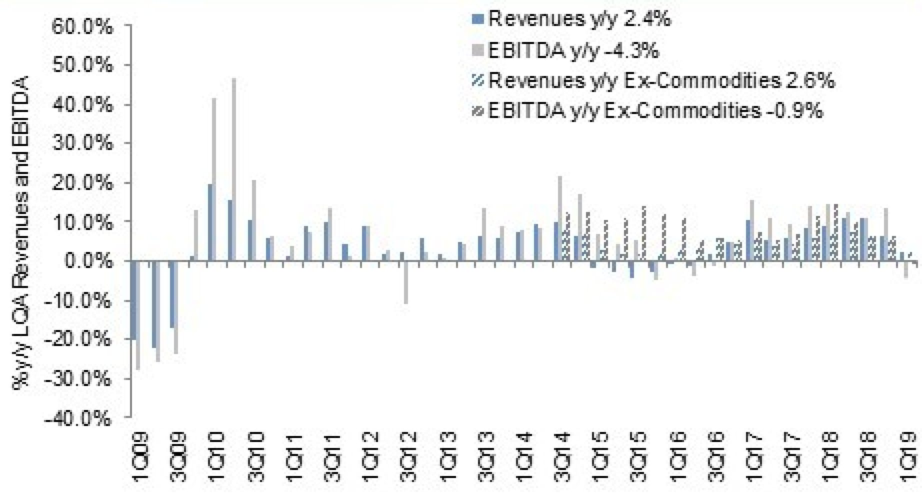
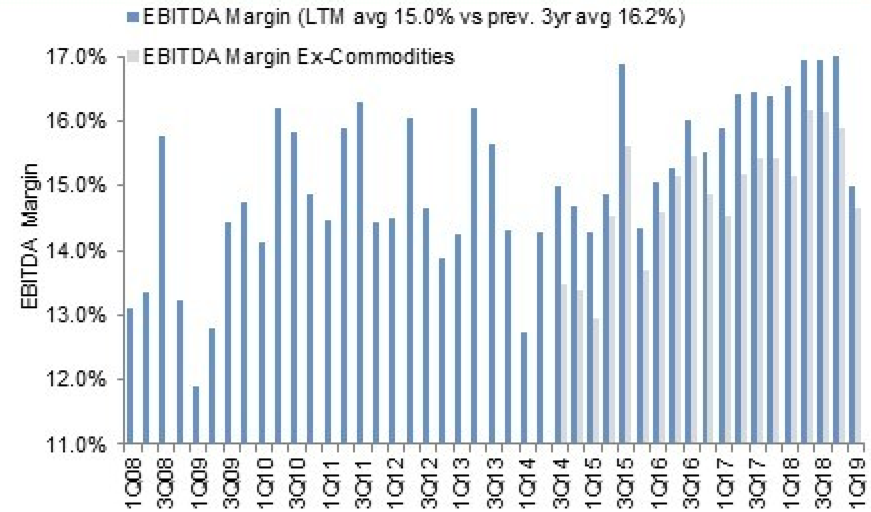
Fundamentals deteriorated modestly in 1Q19

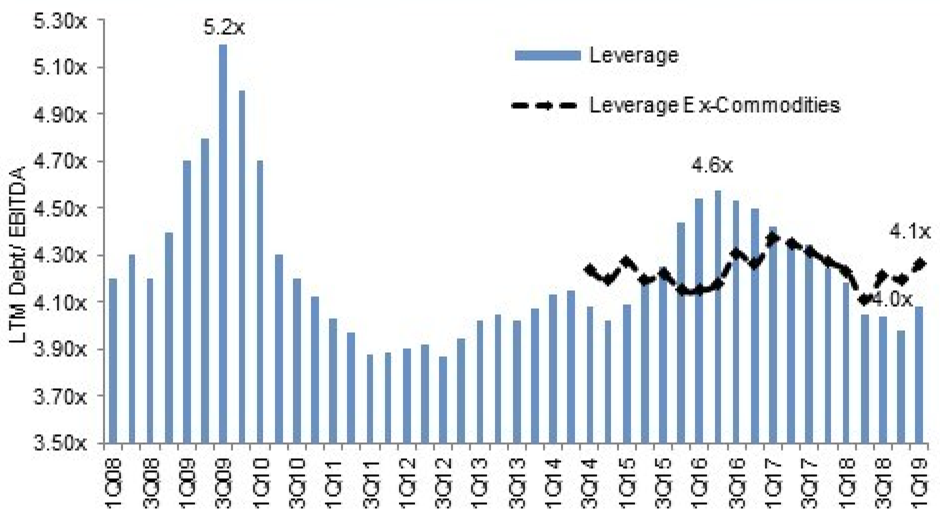
Mixed top and bottom line growth in 1Q19



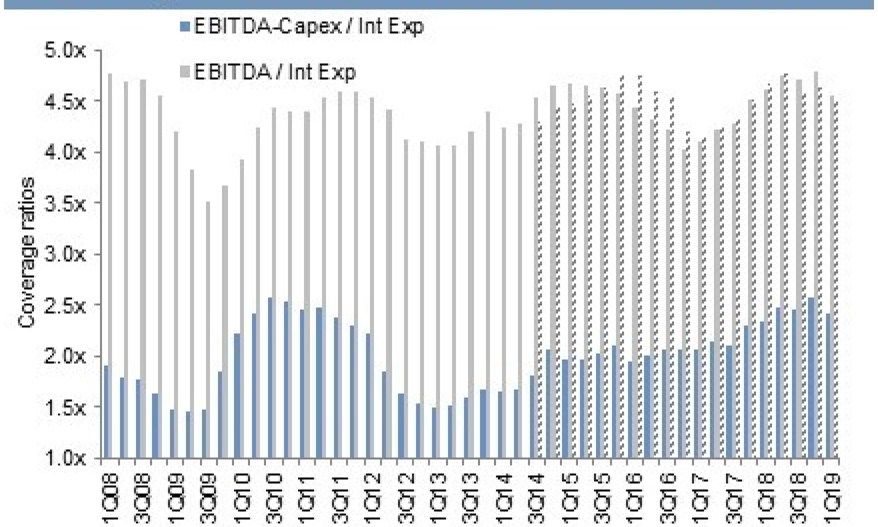
EBITDA margins decreased to a 3 year low



Leverage ratios rose after ten consecutive declines



Coverage ratios decreased to lowest since 4Q17



Sources: J.P. Morgan; Capital IQ.
Note: Includes debt-weighted metrics for 518 HY companies; excludes Financials and Utilities.

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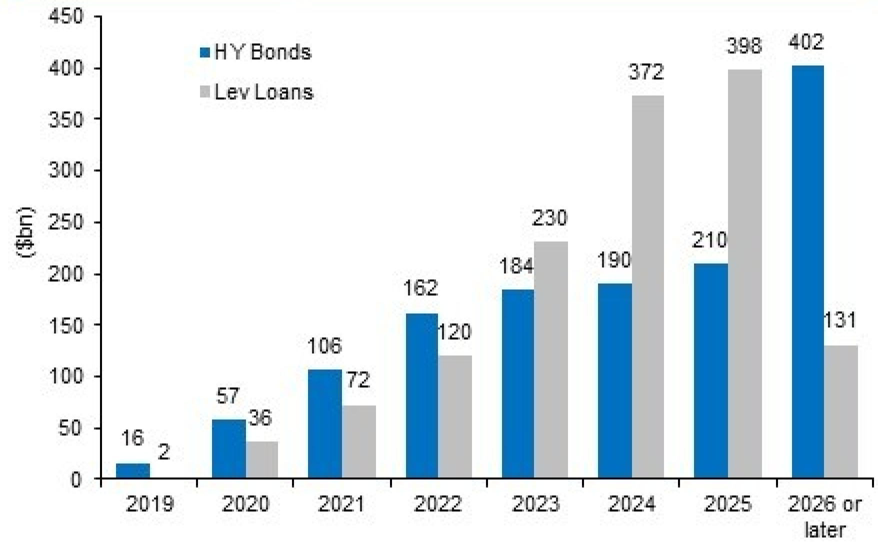
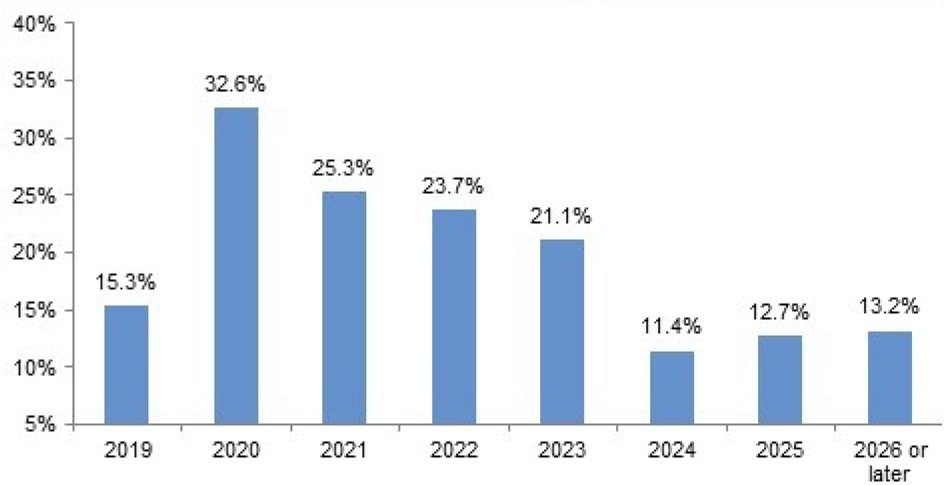
Only $290bn matures through year-end 2021

- Relatively modest in relation to the size of credit markets, a combined $164bn of high-yield bonds and loans are due to mature over the next two years. As a percent of the combined bond and loan markets, for context, this $164bn accounts for 6% of the $2.7trn leveraged credit market.
- Easily manageable, combined maturities over the next two years equate to approximately 7 months' refinancing volume based on the past 24 months' run rate ($22bn/month).

Current maturity wall



Lower rated as a % of total maturity



Note: As of May 10th, 2019

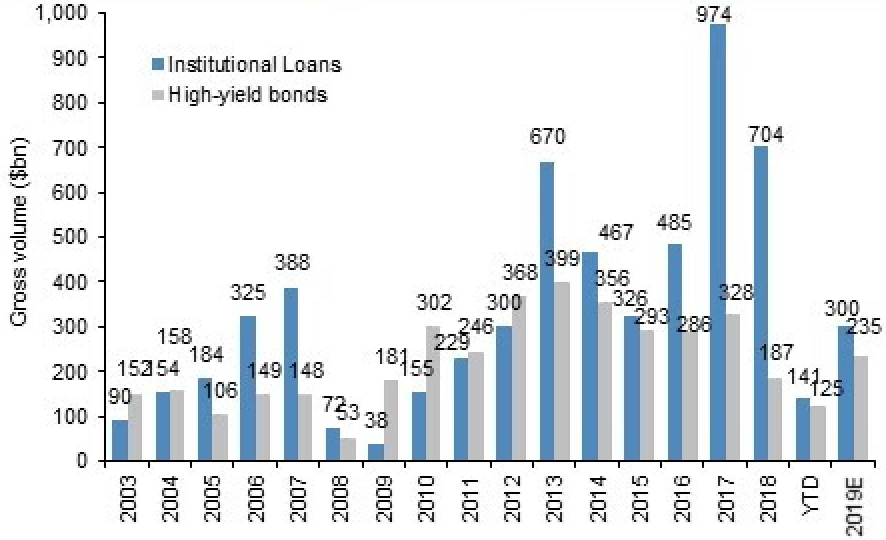
Sources: J.P. Morgan, Markit

HY bond and loan maturity schedules

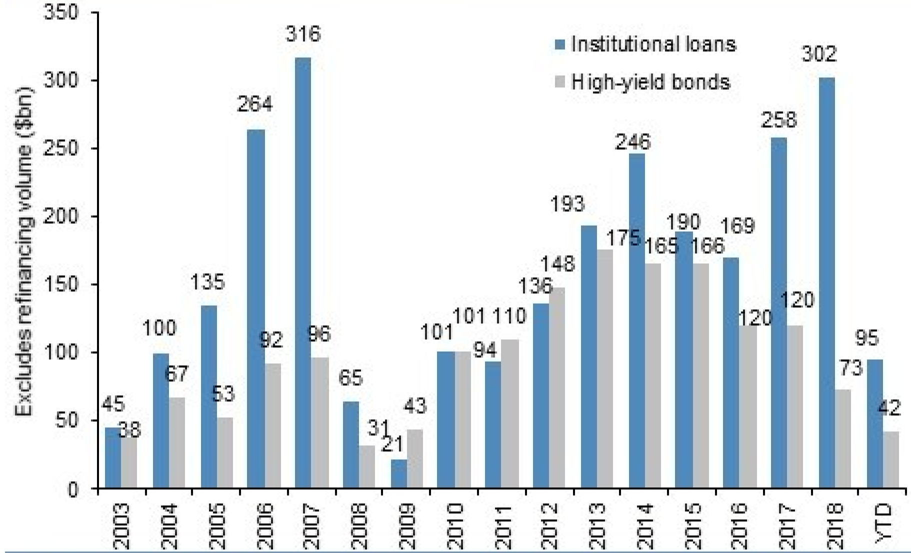
	2-year maturities as % of outstanding	Amount due ($bn)	3-year maturities as % of outstanding	Amount due ($bn)
May-19	6.1%	164	14.1%	380
4Q18	5.9%	155	13.2%	345
4Q17	6.5%	179	14.4%	393
4Q16	7.4%	209	16.0%	453
4Q15	7.1%	191	15.3%	410
4Q14	5.6%	140	13.0%	324
4Q13	6.6%	140	13.3%	283
4Q12	9.4%	184	17.2%	338
4Q11	8.8%	159	21.9%	397
4Q10	10.1%	181	21.3%	382
4Q09	9.0%	150	19.3%	321
4Q08	6.4%	107	14.5%	245
4Q07	6.1%	97	10.0%	159

New issue trends

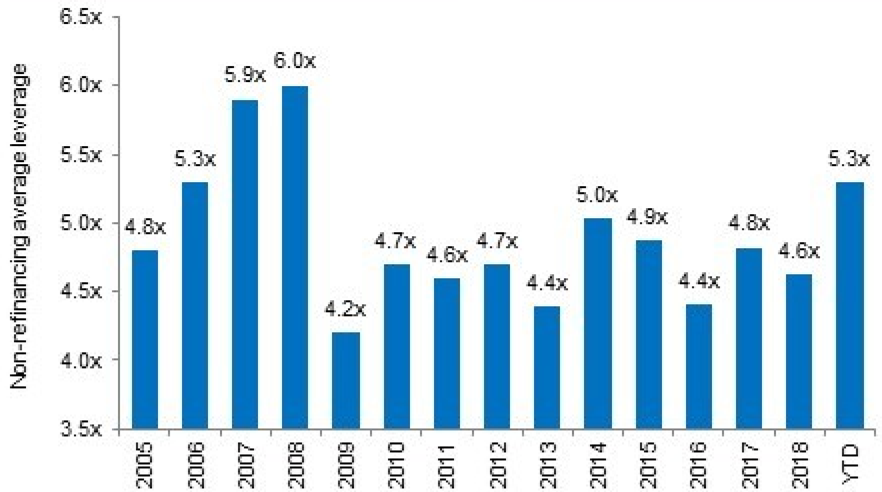
Gross new-issue volumes



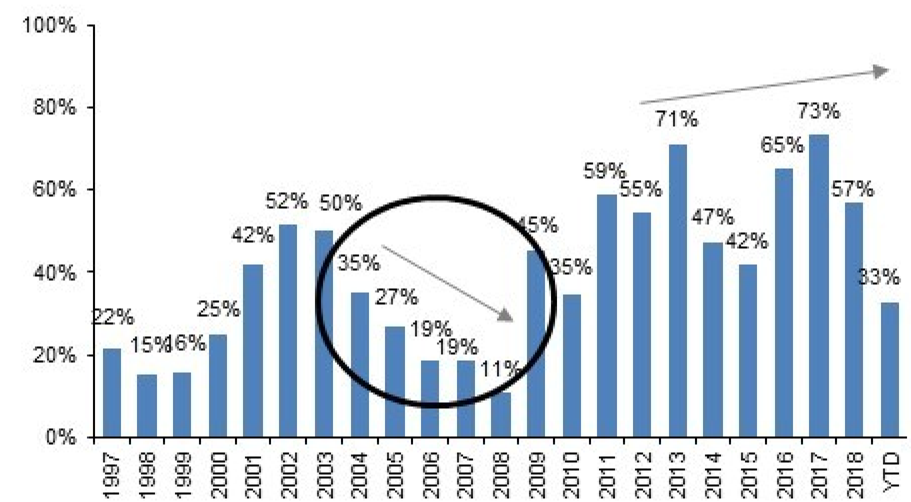
Net new-issue volumes



New issue leverage excluding refinancing



Percent loan issuance used for refinancing



Sources: J.P. Morgan

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Issuance credit quality remains better than ’06/’07

High-yield bonds

	2006	2007	Avg. 06-07	2010	2011	2012	2013	2014	2015	2016	2017	Avg. 15-17	2018	YTD
Total volume ($bn)	149.1	147.9		302.0	245.6	368.1	398.5	355.7	293.2	286.2	328.1		187.4	125.1
Market size ($bn)	946.1	962.0		1228.8	1288.7	1429.4	1561.8	1665.8	1807.8	1977.4	1736.7		1664.8	1641.9
By use of proceeds														
Acquisition finance/LBO ($bn)	65.6	76.9		48.3	54.0	61.9	69.3	91.1	110.0	44.3	56.0		40.3	23.3
% of new issuance	44%	52%	**48%**	16%	22%	17%	17%	26%	38%	15%	17%	**23%**	21%	19%
By rating														
Lower rated ($bn)	31.1	53.6		54.4	43.2	63.7	75.1	65.7	36.8	30.3	49.8		32.6	13.5
% of new issuance	21%	36%	**29%**	18%	18%	17%	19%	18%	13%	11%	15%	**13%**	17%	11%
By security type														
PIK/Toggle/Deferred % of issuance	8%	12%	**10%**	0%	2%	2%	3%	2%	0%	0%	0%	**0%**	0%	0%

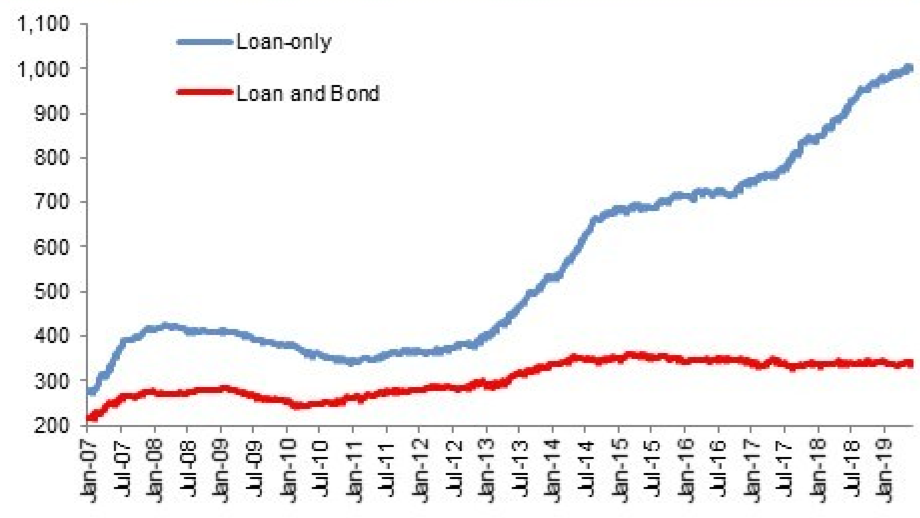
Leveraged loans

	2006	2007	Avg. 06-07	2010	2011	2012	2013	2014	2015	2016	2017	Avg. 15-17	2018	YTD
Total volume ($bn)	324.6	388.3		154.5	229.3	300.5	669.9	466.9	325.8	485.4	973.9		703.7	141.4
Market size ($bn)	399.7	564.8		497.1	530.0	576.5	728.8	883.2	905.2	948.3	1056.2		1212.5	1231.6
By use of proceeds														
Acquisition finance/LBO ($bn)	182.2	247.4		61.2	73.2	88.4	138.4	191.4	159.7	140.0	212.9		255.7	77.1
% of new issuance	56%	64%	**60%**	40%	32%	29%	21%	41%	49%	29%	22%	**33%**	36%	55%
By rating														
Lower rated ($bn)	70.8	97.9		17.3	21.7	22.1	55.6	36.9	10.2	18.8	35.9		19.2	11.5
% of new issuance	22%	25%	**24%**	11%	9%	7%	8%	8%	3%	4%	4%	**4%**	3%	8%
Second-lien % of issuance	9%	8%	**8%**	3%	3%	5%	5%	8%	4%	3%	3%	**3%**	3%	2%
Cov-lite % of issuance	7%	26%	**16%**	5%	24%	33%	51%	66%	72%	74%	79%	**75%**	87%	80%

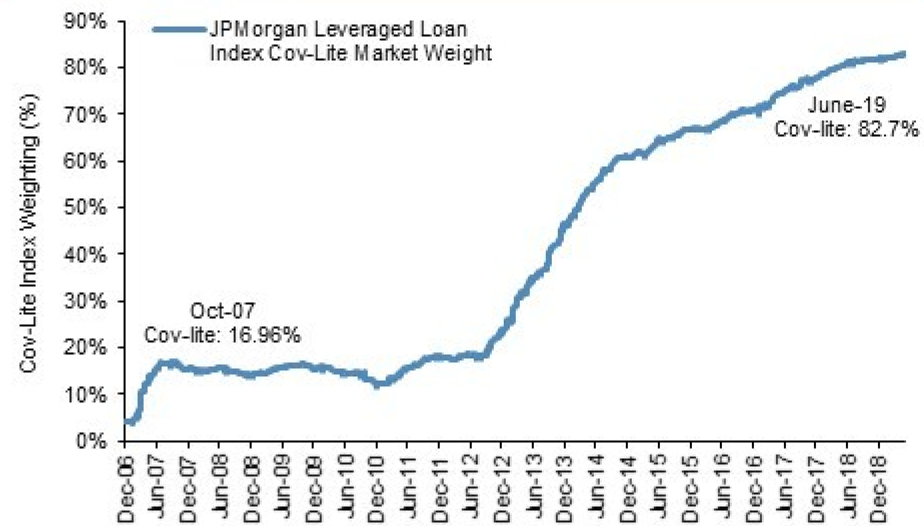
Source: J.P. Morgan

Loan Market Trends

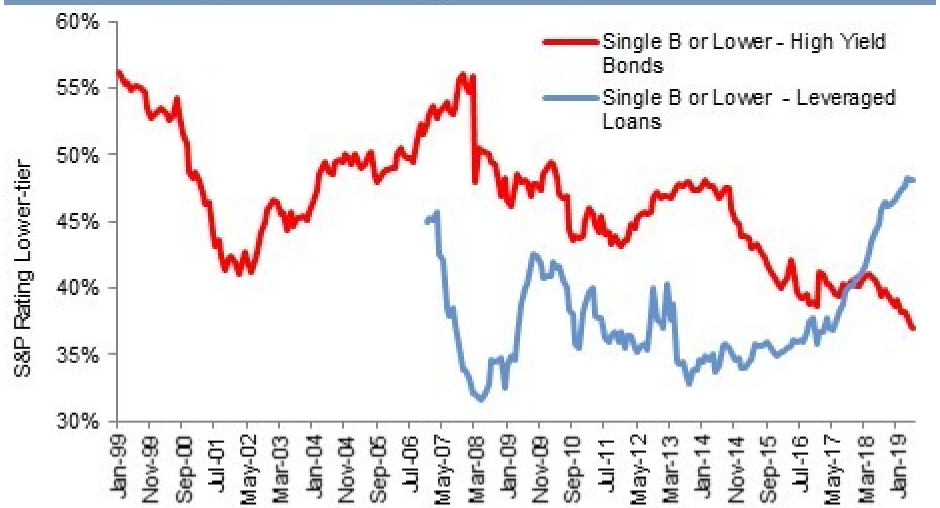
Number of Loan Borrowers



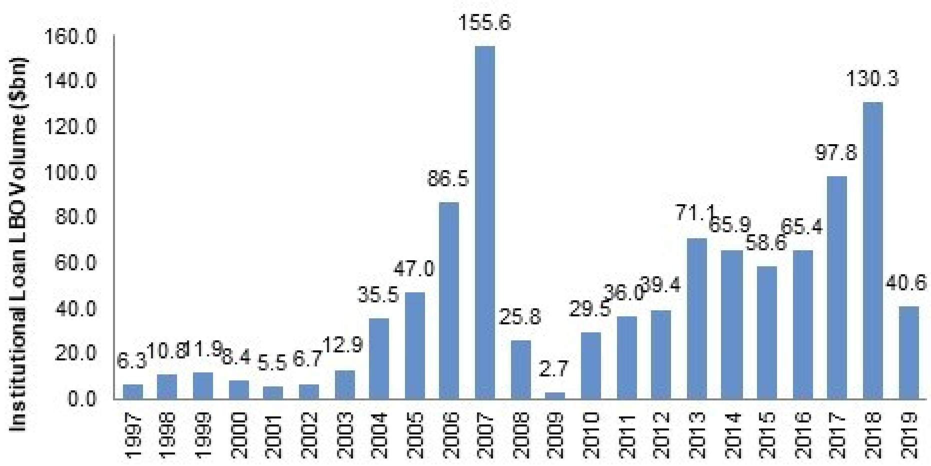
Cov-lite loans



Percentage rated Single B or Lower



Annual LBO Volume



Sources: J.P. Morgan; S&P/LCD

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Today is not 2007

- The lack of bridge risk, limited investor leverage, the composition of new-issuance since early 2009, and a focus by corporations on de-leveraging versus re-leveraging has the market much healthier today compared to 2007.
- One reason loan prices dropped to $60 was the challenging technical backdrop. At the time, we estimate bridge risk peaked at $330bn and CLO warehouse exposure was $40-50bn. Today, we estimate bridge risk to be about $85bn and CLO warehouse exposure to be $15-20bn.
- Just as important, there is considerably less investor leverage today. By itself, less investor leverage should insulate the market well from the kind of forced selling seen in late 2008.

Bridge risk is lower

Bridge risk	Total loans & bonds
2007	~$330bn
Today	~$25bn

CLO warehouses are negligible

CLO warehouses	Total
2007	$40-50bn
Today	$20-25bn

Less investor leverage in the loan market

Total return swap lines	Total	Leverage
2007	$250bn	8-10x
Today	~<$80bn	~3-4x

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Source: J.P. Morgan

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