Review of relationship between UST yields and HG bond spread

The recent period with both declining is not unusual

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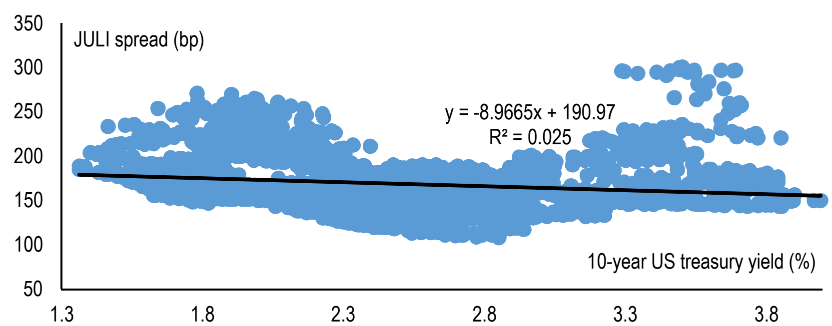
- There has been low correlation historically between UST yields and HG bond spreads, with period of both positive and negative correlation evident
- This is true in both higher volatility and lower volatility periods
- More recent data demonstrates stronger correlation between UST yields and HG bond spreads, however the level of correlations is still low
- By sector Financial spreads are even less correlated than non-Financials to rates trends, despite some link between yields and bank interest margins
- The Technology and Energy sectors have the strongest correlation with UST among sectors
- UST along with oil prices do not demonstrate significant predictive power for JULI-Energy spreads for the last 10 years
- There has been a pattern of more positive rolling correlations in 2Q-3Q and more negative rolling correlations 4Q-1Q each year for the past 7 years
- Historical correlation of JULI spread and 3m-10yr swaption volatility suggests higher correlation of JULI with rates market volatility than with the actual level of rates
- In this analysis we reviewed 10 years of data from 6/2009 until 6/2019

There has been low correlation for the last 10 years between JULI spreads and US Treasury yields



Source: J.P. Morgan

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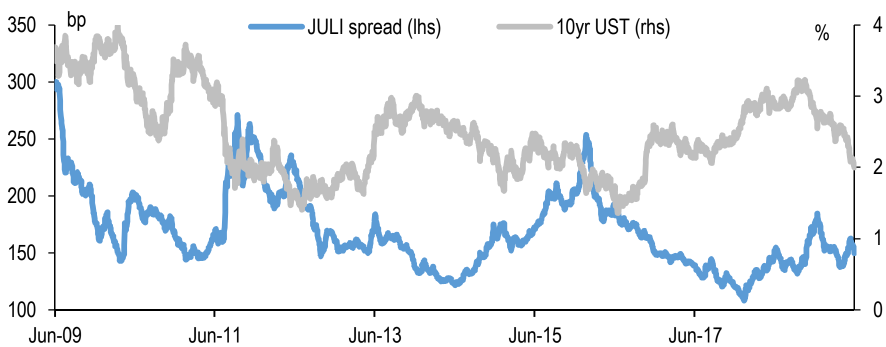
Review of the co-movement of JULI index spread and US Treasury yields

The relationship between US Treasury yields and the JULI index spread is reviewed in this note. A discovery of a statistically significant relationship between these two metrics would give investors a lot of insight about the high grade credit market movements relative to Treasury yields. Specifically in the current uncertain environment and economic outlook, learning of the possible relationship between Treasury rates and JULI spread, could help high grade investors in their investment decision making process. That being said, historical data does not suggest existence of a stable, meaningful relationship. In this study, we show evidence of a weak association between JULI spreads and Treasury yields.

The historical correlation of the JULI spreads and 10-year Treasury yields has been low and non-stable. For the period of the last 10 years (i.e. 06/2009 to 06/2019), the correlation is -16%. Exhibit below shows the time-series of the JULI spread vs. 10-year Treasury yields.

Exhibit 1: JULI spread vs. 10-year US Treasury yields



Source: J.P. Morgan

In spite of the low correlation for the last 10 years, the correlation has been stronger in recent years. After 2015, the correlation is -58% while that of before 2015 is -9%. As illustrated, the average trend between the two metrics is more clear and significant for the after 2015 time period.

Exhibit 2: JULI spread vs. 10-year US Treasury yield, 2009-2015

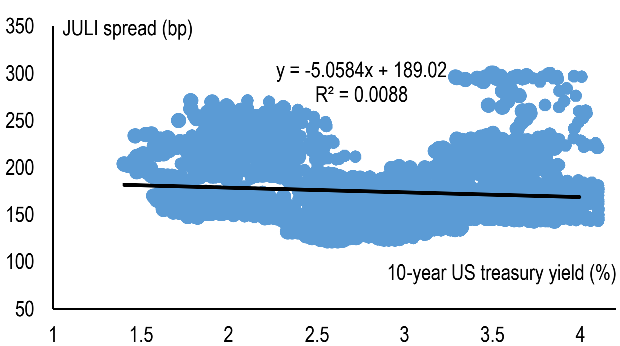
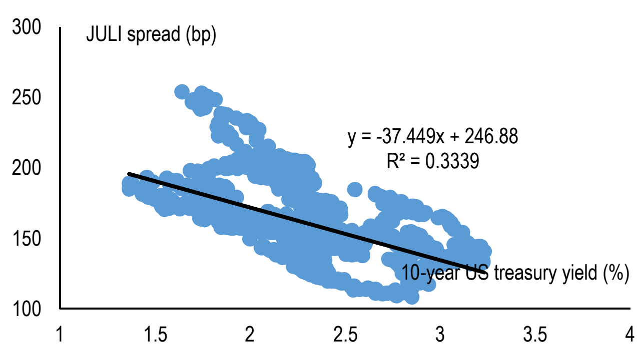


Exhibit 3: JULI spread vs. 10-year US Treasury yield, 2015-2019



Source: J.P. Morgan

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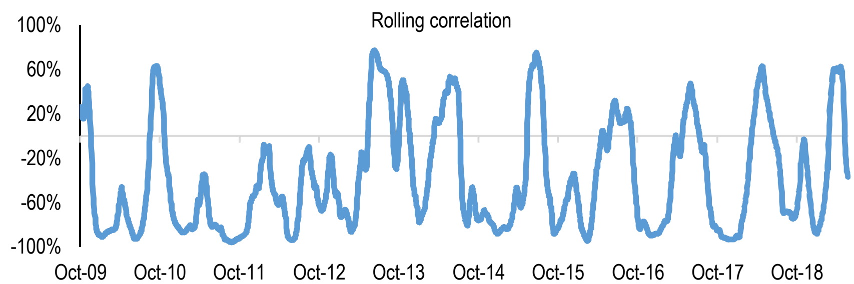
The magnitude and sign of the rolling correlation changes frequently. Exhibit below shows the 90-day rolling correlation of the two metrics. This suggests a switching short-term co-movement regime between JULI spread and 10-year Treasury yield which restricts the construction of long-term forecast models (the R squared of a simple linear regression model is 3% over the full 10 year period). During the study period and using the 90-day rolling correlation, JULI spread and 10-year Treasury yield are positively correlated for 24% of the time and negatively correlated 76% of the time; although the magnitude of the correlation is not consistently significantly strong.

Exhibit 4: 90-day rolling correlation of JULI spread vs. 10-year US Treasury yields



Source: J.P. Morgan

One interesting observation is that correlations have been higher in the summer and lower in the winter, and that this has been a consistent pattern for many years. Taking a closer look at historical data, specifically post 2013, a correlation trend with highest positive rolling correlation around the end of 2Q and the beginning of 3Q is observed. However, the magnitude of these correlations is not consistently and significantly high. The highest negative rolling correlation is observed around the end of 4Q and beginning of 1Q. It isn't obvious to us why this is the case. It is not related to volatility regimes, as discussed in more detail below. The following exhibits show the monthly average of rolling correlations of JULI and 10-year US Treasury yields using different rolling duration windows (i.e. 90, 120, 150 and 180 days) for post-2013 time period.

Exhibit 5: Monthly average of 90-day rolling correlation by year

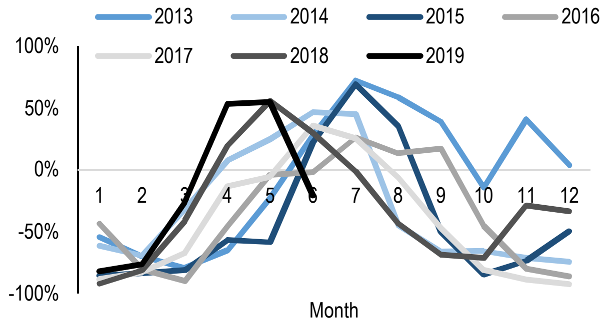


Exhibit 6: Monthly average of 120-day rolling correlation by year

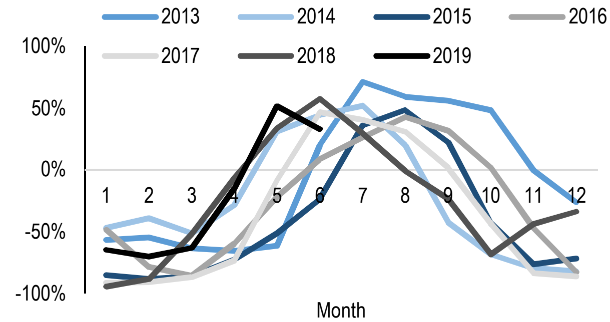


Exhibit 7: Monthly average of 150-day rolling correlation by year

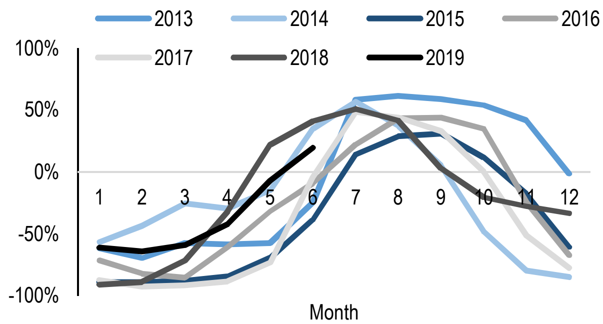
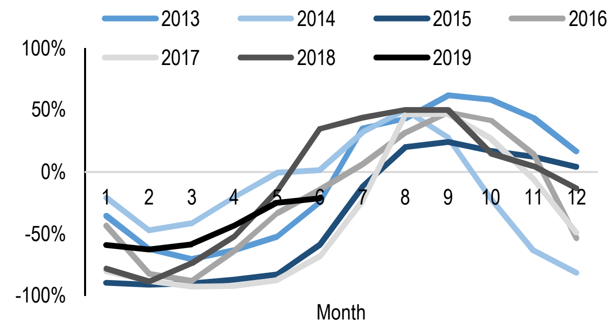


Exhibit 8: Monthly average of 180-day rolling correlation by year



Source: J.P. Morgan

Although above trends look similar across different years, the existence of a consistent trend/relationship between JULI and 10-year Treasury yields in each year is not clear.

Next, we look at the correlation of JULI spread and Treasury yield with similar maturity durations as shown in the following exhibit. Similar maturity comparisons of the JULI spreads to US Treasury yields have negative correlations; however, the magnitude of correlation still does not suggest existence of a significant historical relationship. There is a negative correlation in all of the relationships, but it is a weak one.

Exhibit 9: Correlation of similar maturity JULI spread vs. US Treasury yield

		JULI				
		1-3 year	3-5 year	5-7 year	7-10 year	10+ year
Treasury	12 month	-37%				
	2 year	-34%				
	3 year	-31%	-39%			
	5 year		-29%	-33%		
	7 year			-14%	-28%	
	10 year				-11%	-34%
	30 year					-21%

Source: J.P. Morgan

In addition, following exhibits show the correlation of similar maturity JULI and US treasuries for the periods of before and after 2015.

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Exhibit 10: Correlation of similar maturity JULI spread vs. US Treasury yield after 2015

		JULI				
		1-3 year	3-5 year	5-7 year	7-10 year	10+ year
Treasury	12 month	-50%				
	2 year	-51%				
	3 year	-52%	-41%			
	5 year		-44%	-50%		
	7 year			-48%	-53%	
	10 year				-50%	-64%
	30 year					-40%

Source: J.P. Morgan

Exhibit 11: Correlation of similar maturity JULI spread vs. US Treasury yield before 2015

		JULI				
		1-3 year	3-5 year	5-7 year	7-10 year	10+ year
Treasury	12 month	46%				
	2 year	28%				
	3 year	15%	-1%			
	5 year		-5%	-2%		
	7 year			1%	-17%	
	10 year				-16%	-16%
	30 year					-16%

Source: J.P. Morgan

Stronger correlations are observed for the time period of after 2015 compared to before 2015, with few sign changes mostly in the correlations of 1-3 year JULI spread and similar maturity treasuries.

The exhibits below show the time series of 7-10 year JULI spread and 10-year US Treasury yields along with their 90-day rolling correlation. They are similar to Exhibits 1 and 4 except looking at the 7-10 year JULI spread rather than the entire JULI index. The rolling correlation demonstrates frequent sign and magnitude switching regimes which is consistent with our observation for the JULI index vs. 10-year Treasury yields. For other maturity durations, a robust relationship between JULI and US Treasury rates has not been discovered either.

Exhibit 12: 7-10 year JULI spread vs. 10-year US Treasury yields

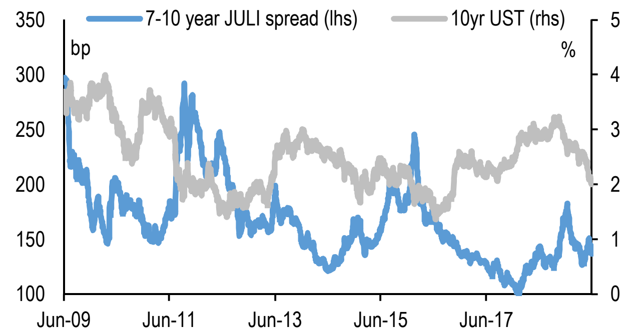
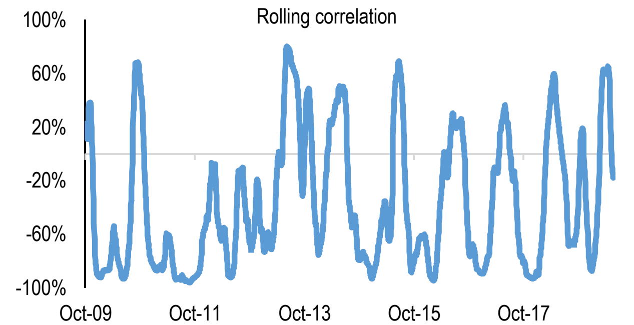


Exhibit 13: 90-day rolling correlation of 7-10 year JULI spread vs. 10-year US Treasury yields



Source: J.P. Morgan

The relationship between Treasury rates and sectors of the JULI index is reviewed below. Among the sectors, Technology has the strongest correlation whereas Consumer Products and US banks have weakest correlations. Non-financials also have higher absolute correlation compared to financials, which show almost zero correlation. It is interesting that Energy has a stronger negative correlation to rates than most sectors. This is logical in that low rates are often a reflection of weaker growth expectations, and weaker growth is particularly negative for the energy sector. That said, spreads in Technology are even more negatively correlated to rates, and yet it's hard to argue that large cap tech (which dominates our index) is more sensitive to either funding costs or growth than most other sectors.

Exhibit 14: Correlation of JULI sectors and 10-year US Treasury yields

Sector	Correlation with 10yr UST
Non-Financials	-27%
Financials	-2%
Technology	-51%
Energy	-40%
Metals/Mining	-39%
Healthcare/Pharmaceuticals	-37%
Food/Drug Retail	-37%
Tobacco	34%
Yankees Telecoms	-33%
Automotive	33%
Non-Food Retail	-29%
REITs	25%
Utilities	-25%
P&C Insurance	21%
Diversified Media	-17%
Transportation	-16%
Yankees Banks	-14%
Cable/Satellite	-14%
Chemicals	-14%
Domestic Telecoms	-13%
Capital Goods	-8%
Food/Beverages	-7%
Life Insurance	-6%
Paper/Packaging	5%
Finance Companies	4%
US Banks	-3%
Consumer Products	-3%

Source: J.P. Morgan

The relationship between Treasury rates and the Energy sector is reviewed below. Crude oil prices as well as the 10-year US Treasury rates are used to estimate JULI-Energy spreads. The following exhibits present the time series of JULI-Energy and 10-year US Treasury rates as well as WTI crude oil price.

Exhibit 25: JULI-Energy spread vs. 10-year US Treasury rates

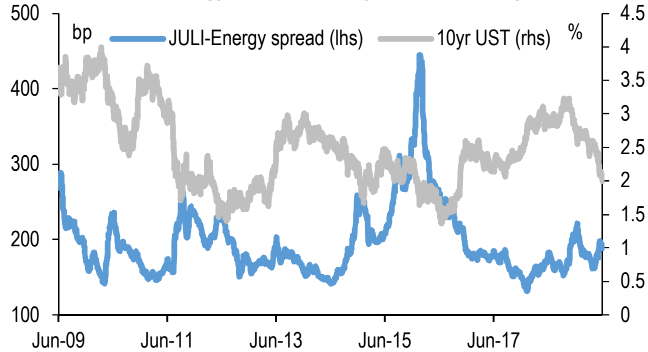
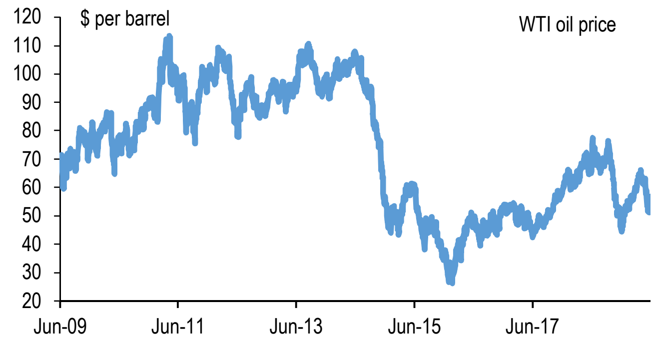


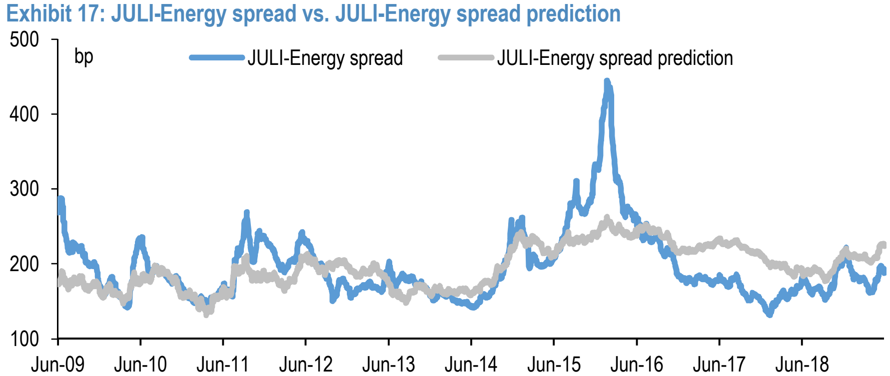
Exhibit 16: WTI crude oil price



Source: J.P. Morgan, FRED (Federal Reserve Bank of St. Louis)

A multi-variate linear regression with 10-year US Treasury yield and oil price as independent variables is developed to predict JULI-Energy spreads. The low adjusted R-squared (i.e. 36%) does not suggest existence of a significant linear association between the predictors and JULI-Energy spread as we can observe that the massive widening in JULI-Energy spreads in 2015-2016 would not be captured by the model.

Exhibit 17: JULI-Energy spread vs. JULI-Energy spread prediction



Source: J.P. Morgan

Overall, less volatile movements of JULI-Energy spreads pre-2015 can be captured more accurately by the predictors, compared to post-2015.

The relationship between Treasury rates and the JULI index spread by rating is reviewed below. The historical correlation between 10-year US Treasury yields and JULI index spreads by rating does not suggest significant association between these two metrics. In recent years, correlation has been consistently more significant across ratings with AAA and BBB having highest and lowest absolute correlations respectively. For non-recent data points (e.g. before 2015), absolute correlation levels are low. The following exhibit presents the correlation of JULI index spread by rating and 10-year Treasury yield for aforementioned time periods.

Exhibit 18: Correlation of JULI vs. 10-year US Treasury yields by rating and time period

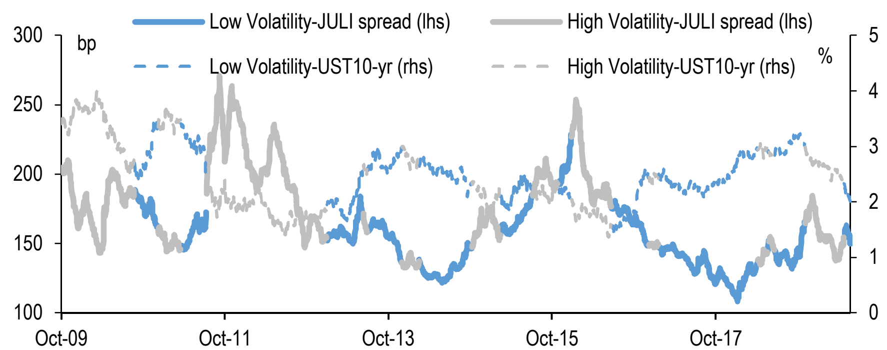
	JULI Rating			
	AAA	AA	A	BBB
Study period (6/2009-6/2019)	-39%	4%	-1%	-26%
Before 2015	-24%	13%	4%	-18%
After 2015	-70%	-66%	-58%	-57%

Source: J.P. Morgan

HG bond spreads and US Treasury yields have been more negatively correlated during periods of higher spread volatility compared to lower spread volatility

In order to further investigate the relationship between JULI and 10-year US Treasury yields, JULI index is segmented into high and low volatility regimes using a rolling volatility approach in which the high and low volatility labels are assigned to the top and bottom 50% percentiles of rolling standard deviation of the JULI index respectively. The following exhibit shows the JULI spread vs. 10-year US Treasury yields, for high and low volatility periods of JULI spreads using a 90-day rolling duration window.

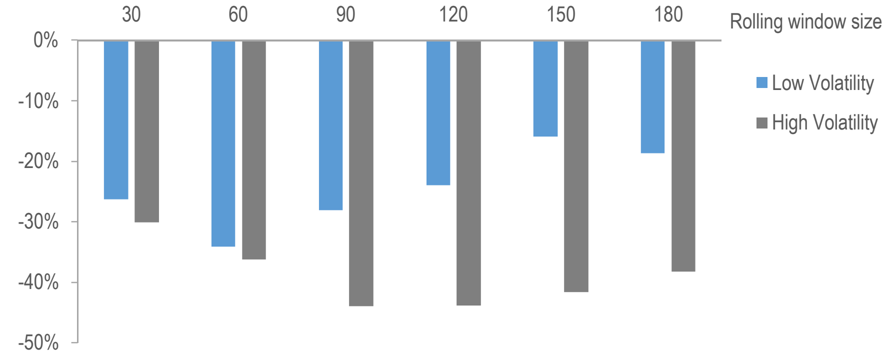
Exhibit 19: JULI vs. 10-year US Treasury yields labelled by JULI volatility regimes



Source: J.P. Morgan

The correlation between JULI and 10-year US Treasury is lower for JULI low volatility regimes for all considered rolling window durations as presented in the exhibit below. The average correlation across rolling window durations during the low and high volatility periods are -25% and -39%, which suggests weak and non-significant associations. As of 6/24/2019, JULI is in a low 90-day rolling volatility regime with -28% historical correlation with 10-year US Treasury yields.

Exhibit 20: Correlation of JULI vs. 10-year US Treasury yields by rolling window duration and volatility regime



Source: J.P. Morgan

JULI spreads correlation with rates market volatility is higher than with the level of rates

In order to get more insight into the possible co-movement of JULI spread and Treasury rates variations, the relationship between 3m-10yr swaption volatility and JULI spread levels has been studied. For the time period of 6/2009 to 6/2019, the correlation between these two metrics is 65%. This suggests stronger co-movement of JULI and Treasury rates swaptions implied volatility, compared to that of JULI and Treasury rates. It is interesting that correlation is as high as 84% in the post recessionary period of 06/2009 to 12/2010, while correlation is reduced to 61% for the period of after 2015. The following exhibits present the historical trends of JULI spreads and 3m-10yr swaption volatilities along with their 90-day rolling correlation. Rolling correlation switches sign and magnitude across time; however, it demonstrates positive correlation most of the time.

Exhibit 21: JULI spread vs. 3m-10yr Swaption volatility

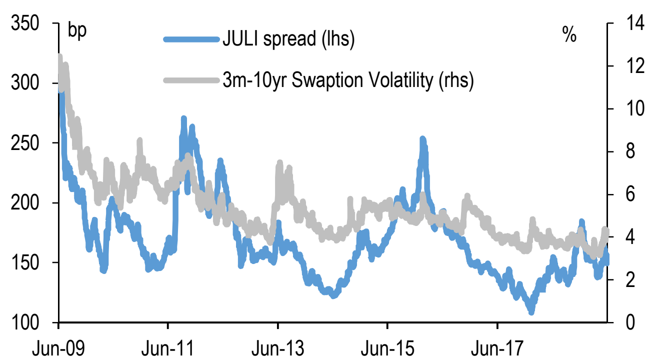
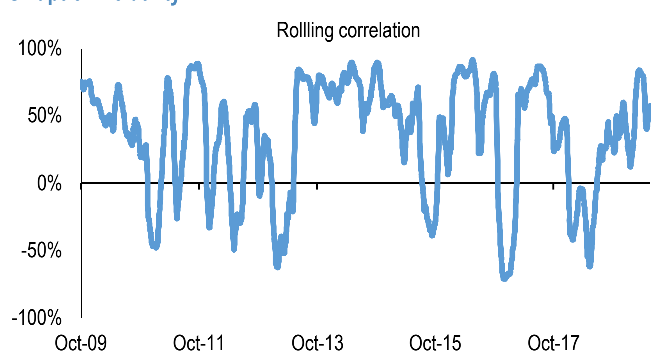


Exhibit 22: 90-day rolling correlation of JULI spread and 3m-10yr Swaption volatility



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