Daiwa's View

Is surge in crude oil prices cause of rise in yields?

- 1) $1 rise in oil price = 1.5bp rise in yields
  2) Rise due to supply constraints is likely to reverse course in the future

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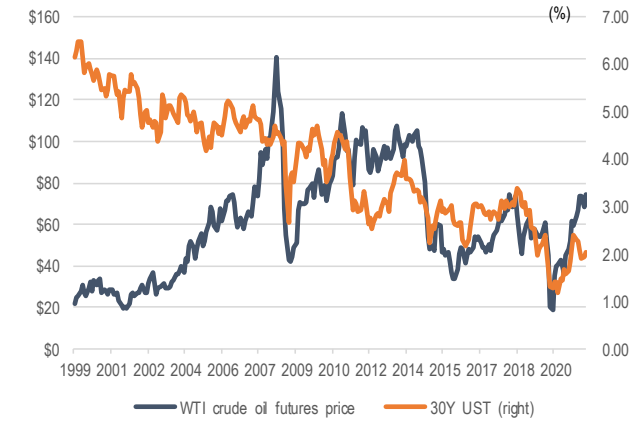
A surge in crude oil prices is garnering attention. How much upward pressure will crude oil prices put on yields?

To state our conclusion at the outset, it is estimated that the 30-year US Treasury yield (UST) rises by around 1.5bp per $1 rise in the WTI crude oil futures price. Based on this relational expression, it is calculated that the rise in superlong yields since late August has been mostly caused by rising crude oil prices (not the Sep FOMC meeting).

If crude oil prices continue to rise going forward, US Treasury yields are likely to follow the trend. In the long term, however, the reason behind the rise in crude oil prices is important. If higher prices are driven by demand, yields are also expected to stay at a high level. Meanwhile, if the rise is temporary and caused by supply constraints, the trend is highly likely to reverse course in the future. In the case that the surge in prices is prolonged due to supply constraints, stagflation is likely to occur.

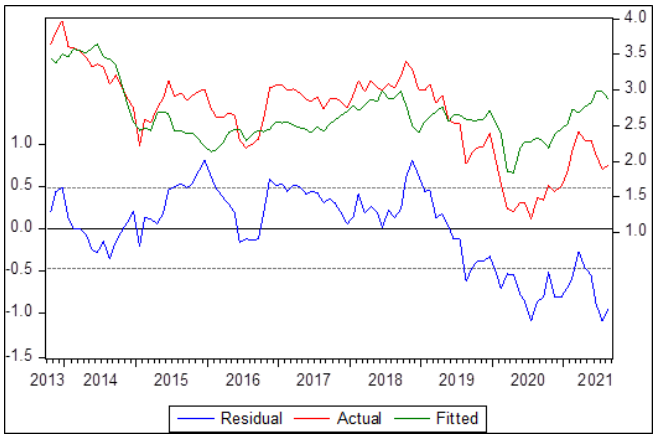
◆ Breakpoint regression analysis
Confirming long-term trends with the 30-year UST and WTI crude oil futures prices showed that the correlation between them had been weak before the global financial crisis. But a relatively strong correlation has been confirmed after the crisis. We conducted regression analysis (explained variable: 30-year UST; explanatory variable: WTI crude oil futures price) by using data since 2013 when central banks in major advanced nations started a full-scale balance sheet policy. In the analysis, the adjusted coefficient of determination came in at 0.40 and the coefficient of crude oil prices was at 0.021 ($1 rise in crude oil price = 2.1bp rise in 30-year UST).

Long-term Trends of WTI Crude Oil Futures Price and 30Y UST



Source: Bloomberg; compiled by Daiwa Securities.

Results of Regression Analysis of 30Y UST



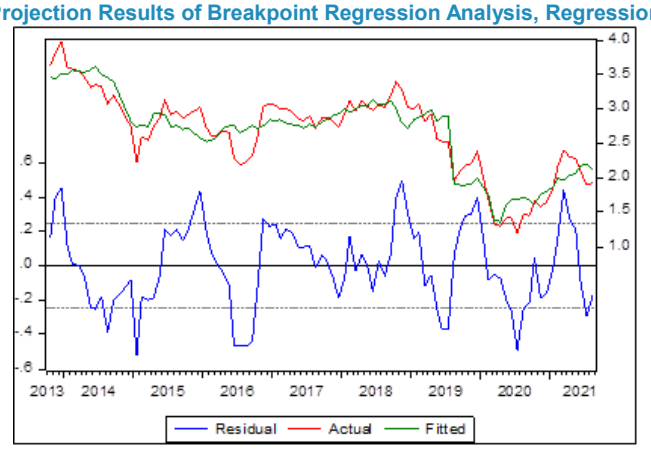
Source: Compiled by Daiwa Securities.

We think that relatively convincing results were gained from even this kind of simple linear regression analysis. However, we observed that the residual between fitted and actual values has expanded (shifted downward) since around 2019. With the most important point for model estimation being the residual analysis, room for improvement is recognized for this model in terms of the behavior of the residual.

As the aforementioned data analysis points to the possibility that structural changes occurred around 2019, we have refined the regression analysis by using breakpoint regression that can cope with structural changes. Firstly, a structural change (downward shift of the constant term) in August 2019 was detected. In the regression model with dummy variables, which reflects structural changes, the adjusted coefficient of determination improved to 0.84, more than double that in the initial analysis. In addition, the residual trend has changed, and it has randomly fluctuated up and down approximately around 0 (left-hand chart below). In this model, the coefficient of the WTI crude oil futures price is about 0.015, indicating that the 30-year UST rises by 1.5bp per $1 rise in the WTI crude oil futures price.

We tested this by applying this relational expression to data in the past month. While the WTI crude oil futures price rose by $12.5 to $74.83 on 29 September, from its recent bottom of $62.32 on 20 August, the 30-year UST rose by 0.19% from 1.87% to 2.06%. According to the model, the rise in the 30-year UST is estimated at 0.1875% (12.5 x 0.015), and, therefore, the extent of the actual rise and the model's projected value are almost equal. Given this, as well, we think that the value 0.015 is largely appropriate as the sensitivity coefficient of the 30-year UST for changes in the WTI crude oil futures price.

Projection Results of Breakpoint Regression Analysis, Regression Equation



Estimation Equation:
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USGG30YR_INDEX = 2.027 + **0.015*CL1_COMDTY** - 0.953*@AFTER("2019M08")

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.027011	0.089199	22.72456	0.0000
CL1_COMDTY	0.015021	0.001372	10.94712	0.0000
@AFTER("2019M08")	-0.952956	0.058153	-16.38714	0.0000

R-squared	0.848798	Mean dependent var	2.656856
Adjusted R-squared	0.845511	S.D. dependent var	0.613200
S.E. of regression	0.241019	Akaike info criterion	0.023184
Sum squared residual	5.344276	Schwarz criterion	0.103833
Log likelihood	1.898756	Hannan-Quinn criterion	0.055772
F-statistic	258.2293	Durbin-Watson stat	0.510301
Prob (F-statistic)	0.000000		

Source: Compiled by Daiwa Securities.

These estimation results suggest that we should assume a continued rise in the 30-year UST if the uptrend in crude oil prices continues going forward. In the near term, such trends are likely to continue.

However, the model just estimates values under the same conditions as in the past. It is disputable whether the current rise in the crude oil futures price due to the impact of the pandemic will satisfy such conditions.

In that sense, the comments by Fed Chair Jerome Powell in his 28 September speech are suggestive. He explained that “The current inflation spike is really a consequence of supply constraints meeting very strong demand, and that is all associated with the reopening of the economy, which is a process that will have a beginning, a middle and an end. … For some time, we and others have been forecasting that the current inflation spike will not lead to a new inflation regime in which inflation remains high year after year.” We think that this explanation can also be largely applied to crude oil prices. In a word, it is highly likely that rising crude oil prices (and yields) stemming from supply constraints are transitory.

However, even if it is transitory, there is a good chance for a scenario in which crude oil prices continue to rise for the time being. For example, possible reasons are a cut in output by oil-producing nations (incl. natural disasters), stagnant logistics, and a temporary increase in demand (due to forced savings). The first and second factors are supply-side issues, while the third one is a demand-side issue.

Regarding the first factor, we are slightly concerned about a drop in the supply of fossil fuels before the shift to renewable energy is fully implemented. In this case, the concerns are bad inflation due to higher costs, the so-called cost-push inflation, and stagflation. It is not easy to examine how stagflation will have an impact on yields. But, in the case of a recession that leads to relative impoverishment due to bad inflation (deterioration of output gap), we think stagflation would eventually result in a decline in yields. To make a long story short, we should consider the yield uptrend caused by temporarily rising energy prices to be transitory.

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