

APPENDIX

What drives bond yields – Part 3: Catalysts

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This appendix provides further technical detail to [What drives bond yields – Part 3: Catalysts](#).

Section A1: Variable descriptions

Table A1 presents definitions of the explanatory variables used to explain the components of the 10-year US Treasury bond yield as estimated in [D'Amico, Kim & Wei \(2018\)](#) as referred to in [D'Amico, Walsh & Wei \(2019\)](#).

Table A1: Variables used to explain the sub-components of US Treasury 10-year bond yields

Expected real interest rates

Series	Frequency	Methodological note	Sign of relationship
Real policy rate expectations	Monthly	The median of expected Federal Funds Rates along the futures strip less market expectations for inflation (as per the 5-year/5-year forward starting inflation swap).	Positive
Net supply expectations	Monthly	Government and CBO forecasts of budget deficits less expected change in US Federal Reserve balance sheet based on guidance around large scale asset purchase programs.	Positive

Source: Bloomberg, Macrobond, QTC Economics & Research

Expected inflation

Series	Frequency	Methodological note	Sign of relationship
Trend inflation	Monthly	The 7.5-year moving average of US CPI inflation.	Positive
Volatile items	Monthly	Food and energy prices based on weights and index values from the US Bureau of Labor Statistics.	Positive

Source: Bloomberg, Macrobond, QTC Economics & Research

Real interest rates risk premium

Series	Frequency	Methodological note	Sign of relationship
Policy rates risk	Monthly	Real Fed Funds Futures Curve Shape. This is the difference between peak and trough in real Fed Funds Rate (FFR) expectations. Peak real FFR expectations equals the difference between the expected peak in the FFR as implied by the Fed Funds Rate futures strip less an estimate of upside risks to inflation. The latter is given by the average of expected inflation over the next four quarters at the 90 th and 75 th percentile of the distribution as per the Federal Reserve Bank of New York's Outlook-at-Risk estimates.	Positive

Series	Frequency	Methodological note	Sign of relationship
		Trough real FFR expectations equals the difference between the expected trough in the FFR as implied by the Fed Funds Rate futures strip less an estimate of downside risks to inflation. The latter is given by the average of expected inflation over the next four quarters at the 10 th and 25 th percentile of the distribution as per the Federal Reserve Bank of New York's Outlook-at-Risk estimates.	
Gross supply risk	Linear interpolation of annual budget deficit forecasts to monthly basis	Based on stochastic volatility of Government (pre-2007) and CBO (post-2007) forecast errors of the budget deficit for the first five years of the projection period (based on the approach outlined in Jurado et al (2015)).	Positive
Liquidity risk	Monthly	Price-to-impact measure of liquidity (pre-2017) and Bloomberg's US Government Securities Liquidity Index (post-2017).	Positive
Other market risk	Monthly	The residual from an OLS regression of the variables listed above on the ICE BofA MOVE Index (a gauge of expected future movements in US bond prices). This regression was run to remove the impact of other types of uncertainty that may influence general market uncertainty such that what is left should only capture that related to the outlook for bond markets.	Positive

Source: Bloomberg, Macrobond, QTC Economics & Research

Inflation risk premium

Series	Frequency	Methodological note	Sign of relationship
Inflation uncertainty	Monthly	<p>Simple average of the following variables (all normalised):</p> <ol style="list-style-type: none"> 1. The three-month moving average of the interquartile range (75th percentile less 25th percentile) of inflation forecasts from Federal Reserve Bank of New York's Outlook-at-Risk estimates. 2. The three-month moving average of dispersion (90th percentile less 10th percentile) of inflation forecasts from Federal Reserve Bank of New York's Outlook-at-Risk estimates. 3. Inflation asymmetry (the net of the difference between the 90th and 50th percentiles of inflation forecasts from Federal Reserve Bank of New York's Outlook-at-Risk estimates and between the 50th and the 10th percentiles). 4. The four-month moving average of price pressure asymmetry. This is given by the net of the difference between the probability of high (greater than 2.5 per cent) and moderate (between 1.5 and 2.5 per cent) inflation outcomes and the probability of modest (between 0 and 1.5 per cent) and low (less than 0 per cent) inflation outcomes based on estimates from the Federal Reserve Bank of St Louis. 5. The three-month moving average of price pressure dispersion (difference between the probability of outcomes greater than 2.5 per cent and between 0 and 1.5 per cent). 6. The stochastic volatility of inflation forecasts based on the approach used in Jurado, Ludvigson & Ng (2015). 	Positive

Series	Frequency	Methodological note	Sign of relationship
Market uncertainty	Monthly	The residual from an OLS regression of inflation uncertainty on the ICE BofA MOVE Index (a gauge of expected future movements in US bond prices). ¹ This regression was run to remove the impact of inflation uncertainty from this measure of general market uncertainty such that what is left should only capture that related to the outlook for bond markets.	Positive
Inflation expectations	Monthly	The difference between the 5-year/5-year forward starting inflation swap and trend inflation (where the latter was defined as the 7.5-year moving average of US CPI inflation).	Positive

Source: Bloomberg, Macrobond, QTC Economics & Research

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¹ This is intended to give a sense market uncertainty unrelated to that around the outlook for inflation. It should therefore, in principle, have no relationship to the inflation risk premium. However, it is correlated so can offer some explanatory power. Further investigation is required to identify what theoretical (if any) relationship might underpin this. It is possible that none exists and this correlation reflects measurement error.