The Slope of the Term Structure and Recessions: Evidence from the UK, 1822 – 2016

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As the yield curve in the USA has now once again inverted, following the Fed's attempt to raise the short-term official interest rate back towards 'normal' levels, there has been renewed interest in the question of whether such inversion, with short-term rates higher than the long-term rate, has been and remains an effective predictor of recessions. Virtually all the empirical work on this so far has been done for the U.S.: see, for example, Gerlach and Stuart (2018) and the related references given there. An interesting question to ask, therefore, is whether the same phenomenon works equally well in the U.K. We investigate this by examining whether the monthly spread between long interest rates (the consol yield before 1914 and the yield on 10-year gilts after World War 1) and short interest rates (the yield on three-month Treasury bills) is able to predict a recession indicator up to eighteen months ahead across three historical periods, the pre-World War 1 era from 1822 to 1913, the inter-war years between 1920 and 1938, and the post-World War 2 period beginning in 1946.

A key requirement to carry out this analysis is the availability of a suitable recession indicator at a monthly frequency. The monthly OECD recession indicator for the U.K. is only available from 1955, and so it is a useful empirical exercise to construct such an indicator for the initial years of the post-World War 2 period and for the earlier historical periods. How this is done is outlined in detail in Mills, Capie and Goodhart (2018), with the indicators so obtained (which are defined from peak-to-trough of their associated business cycles) being shown in Figures 1–3 for each of the three historical periods. The pre-World War 1 recession indicator is obtained after interpolating an annual business cycle to obtain monthly values, while the inter-war recession indicator is derived from a business cycle adjusted to deal with the rapid declines in GDP between May and July 1921 and during the general strike of April to December 1926. The indicators derived for the pre-World War 2 periods match well the usual annual recession chronology for the U.K.: see, for example, Capie and Mills (1991).

For each of the three periods, these recession indictors were regressed on the current spread for forecast horizons up to eighteen months, with the current long interest rate and current recession indicator included as additional control variables. Two econometric issues need to be confronted when estimating these regressions. The discrete nature of the recession indicator, which takes the value 1 in a recession and 0 otherwise, requires the use of a probit regression, while the presence of future values of the indicator as the dependent variable

introduces autocorrelation into the regression residuals that needs to be accounted for when constructing coefficient standard errors and associated confidence intervals.

Figure 4 shows the spread coefficient estimates for the pre-World War 1 era 1822–1913. The estimates are negative for all forecast horizons and are significantly so for horizons greater than one month. Figure 5 shows the spread coefficient estimates for the inter-war years 1920–1938. The estimates are negative for all forecast horizons, being significant at the 10% level or less for horizons between five and ten months. Figure 6 shows the spread coefficient estimates for the post-World War 2 period. Once again, the estimates are negative for all forecast horizons and significantly so for all horizons less than eighteen months.

Because a negative coefficient on the current spread implies that the 'inverted' yield curve does forecast future recessions, strong support is found for the hypothesis that the inverted yield curve is also a predictor of U.K. recessions for horizons up to 18 months for both the pre-World War 1 and post-World War 2 periods. The evidence is not quite as conclusive for the inter-war years in that, although the spread coefficient estimates are negative at all horizons, the level of significance is only reasonably small for horizons between five and ten months. This finding nevertheless accords well with the evidence from the U.S.

References

Capie, Forrest H. and Terence C. Mills (1991). 'Money and business cycles in the US and the UK, 1870 to 1913', *Manchester School* 59, 38-56.

Gerlach, Stefan and Rebecca Stuart (2018). 'The slope of the term structure and recessions: the pre-Fed evidence, 1857-1913', CEPR Discussion Paper DP13013.

Mills, Terence C., Forrest H. Capie and Charles A.E. Goodhart (2018). 'The Slope of the Term Structure and Recessions: Evidence from the UK, 1822 – 2016', CEPR Discussion Paper DP13159.

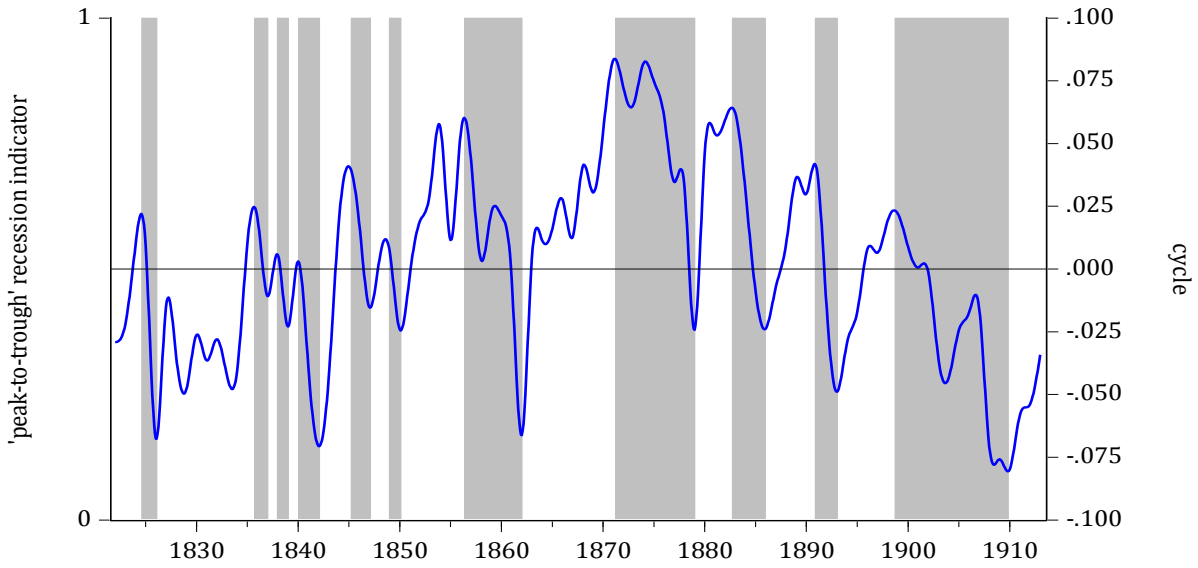

Figure 1 Peak-to-trough recession indicator for 1822 – 1913 with associated business cycle.

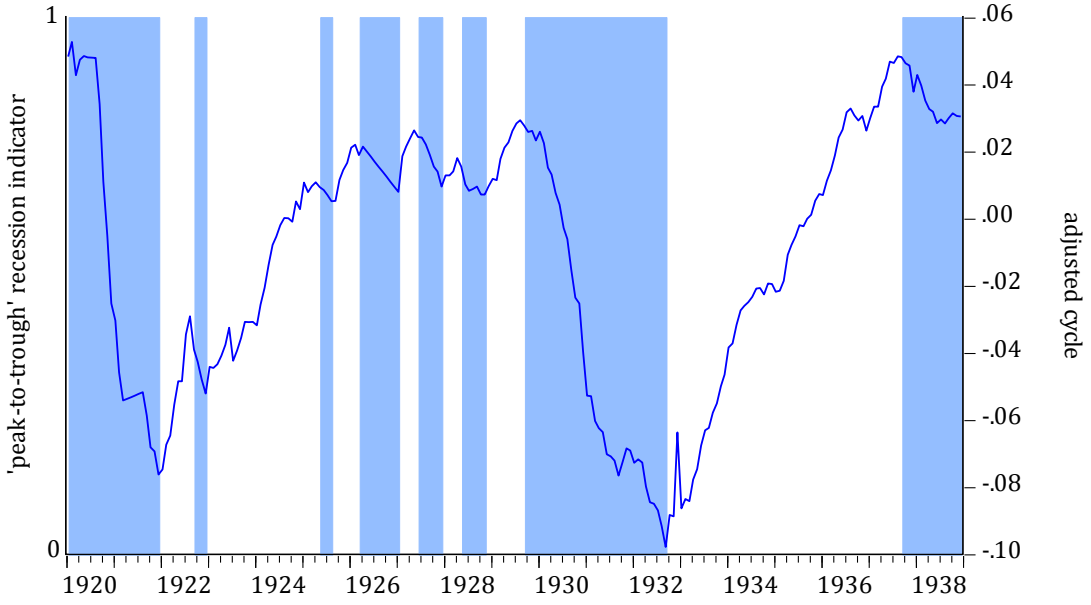

Figure 2 Peak-to-trough recession indicator for 1920 – 1938 with associated business cycle.

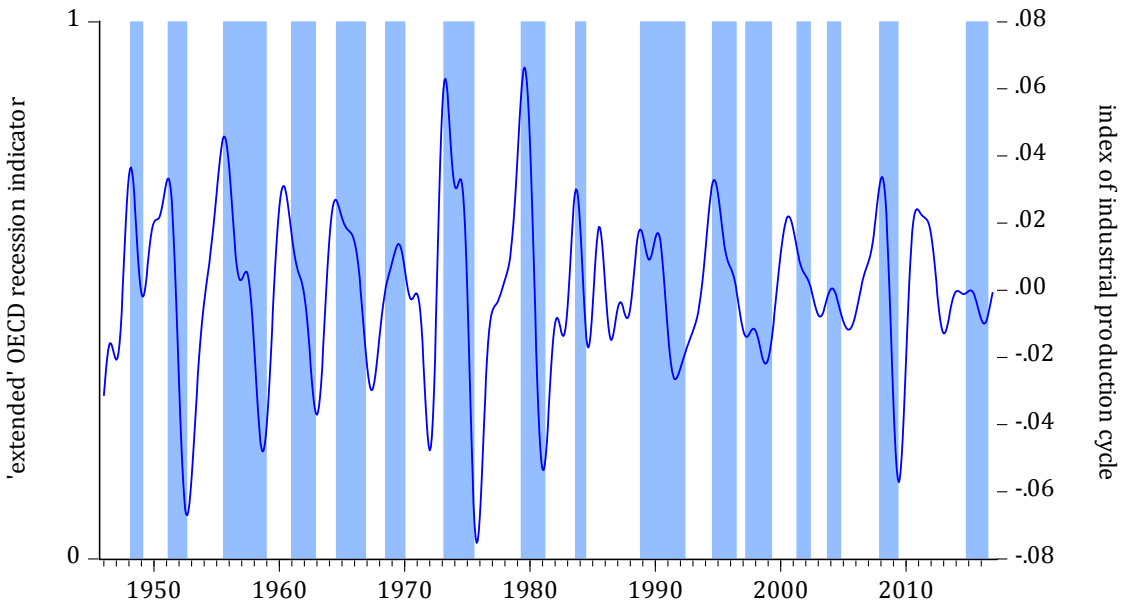

Figure 3 Peak-to-trough recession indicator for 1946 – 2016 with associated business cycle.

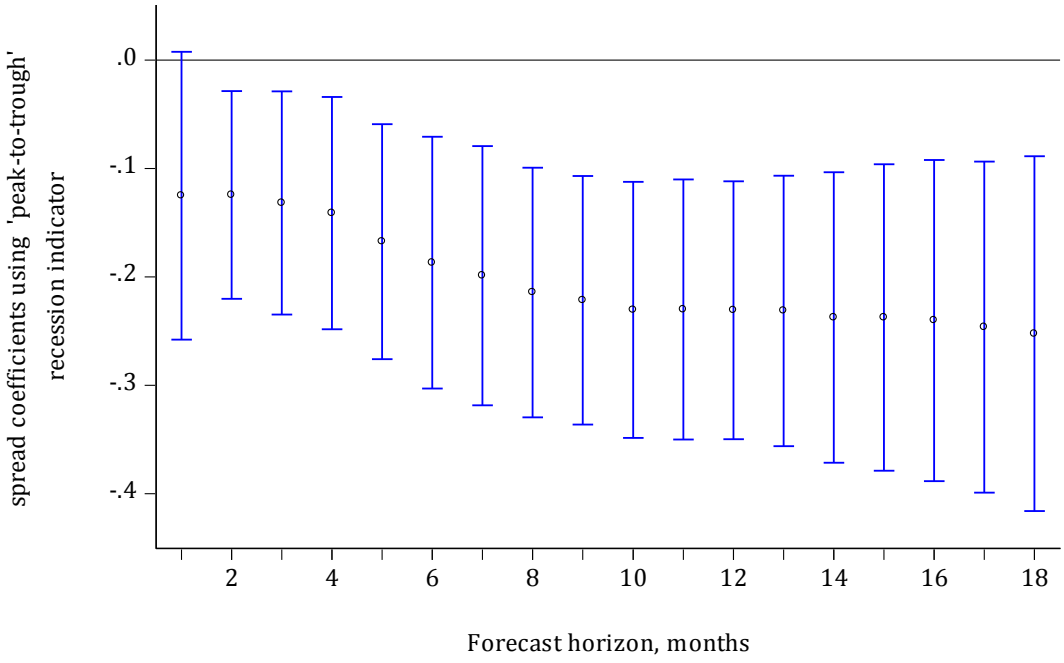

Figure 4 Spread coefficient estimates: 1822 – 1913. The candlesticks in Figures 4–6 represent approximate 95% confidence intervals

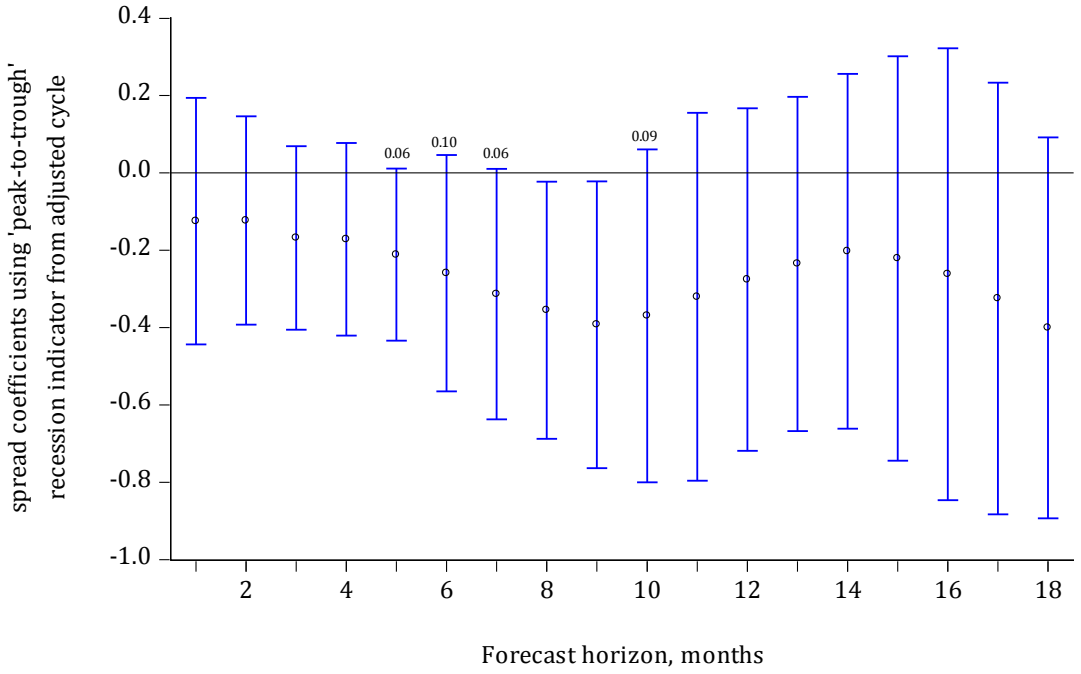

Figure 5 Spread coefficient estimates: 1920 – 1938. Figures above candlesticks are marginal probability values.

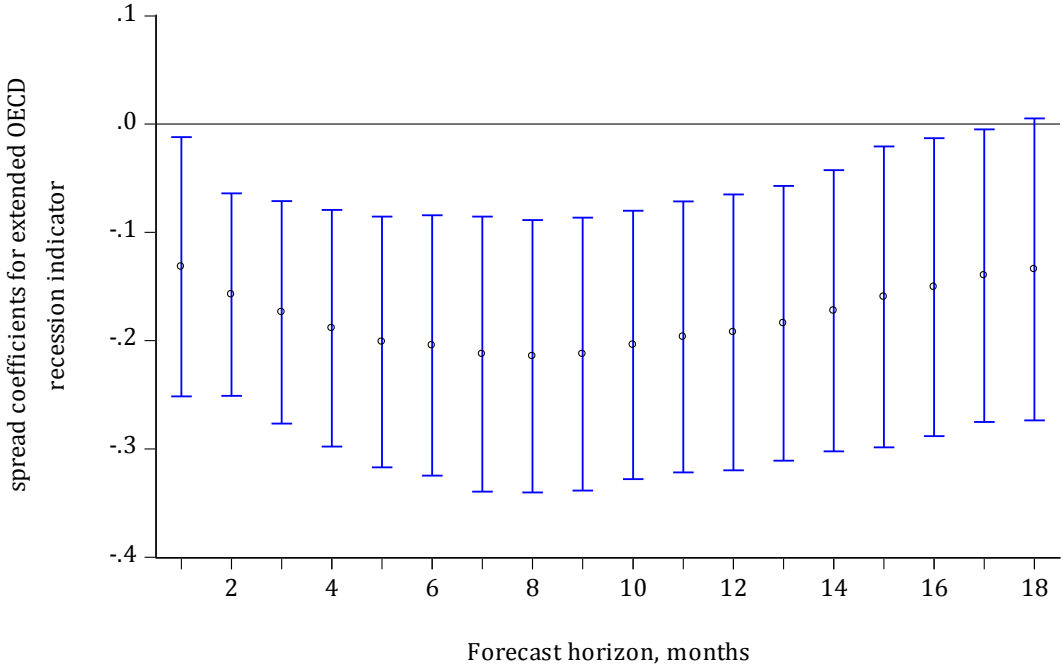

Figure 6 Spread coefficient estimates: 1946 – 2016.