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The expectations hypothesis and decoupling of short- and long-term US interest rates: A pairwise approach☆

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ABSTRACT

The link between short-term policy rates and long-term rates elucidate the potential effectiveness of monetary policy. We examine the US term structure of interest rates using a pairwise econometric approach advocated by Pesaran (2007). Our empirical modelling strategy employs a probabilistic test statistic for the expectations hypothesis of the term structure based on the percentage of unit root rejections among all interest rate differentials. We find support for the expectations hypothesis and provide new insights into the nature of interest rate decoupling which are of value to policymakers. The maturity gap associated with interest rate pairs negatively impacts on the probability of stationarity, and also on the speed of adjustment towards long-run equilibrium. We further show that the speed of adjustment has become more sensitive to the maturity gap over time.

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1. Introduction

Monetary policy typically involves the influencing of short-term interest rates by central banks. However, the potential effectiveness of monetary policy actions will depend on the impact that such actions may have on long-term rates. The most influential theory that explains the interaction between interest rates of different maturities is the expectations hypothesis of the term structure (EHTS). According to this, long-term interest rates can be thought of as an average of expected future short-term rates, so that an increase in the long-term rate can be interpreted as implying rising future short-term rates. Because of this, it has long been recognised that the slope of the yield curve constitutes an important source of information for the evolution of future real economic activity. For instance, Estrella and Hardouvelis (1991) not only find that a positive curve slope is associated with future increases in real economic activity, but also that it provides additional predictive power for the latter over other commonly used variables such as leading indicator indices, real short-term interest rates, and past values of rates of inflation and real economic activity. Many macroeconomic models typically employ a single interest rate in representations of the economy despite the presence of a spectrum of differing maturities upon which decision-making is based. If the expectations theory prevails, then central banks can influence long-rates by operating at the short-end of the market. In addition to this, the EHTS is related to the concept of market efficiency insofar as two implications of the EHTS are that the forward rate is an unbiased predictor of future spot rates, and that this predictor cannot be improved by using any currently available information.

Ever since the introduction of the concept of cointegration in the econometrics literature by Engle and Granger (1987), one way of testing the EHTS is based on the idea that interest rates of different maturity maintain a long-term equilibrium relationship, so that the interest rate spread (or differential) does not exhibit a systematic tendency to increase (or decrease) over time such that it reverts to its mean; see, for example, early applications by Engle and Granger (1987), Campbell and Shiller (1987), Stock and Watson (1988), Hall, Anderson, and Granger (1992) and Shea (1992). Within this framework, the unit root null hypothesis of a non-stationary interest rate spread is tested against the alternative that the spread is stationary. When interest rates of different maturity are non-stationary, or $I(1)$, processes, support for the alternative hypothesis that the interest rate spread is stationary can be viewed as implying that there exists a cointegration relationship between the interest rates, and that the cointegrating vector is equal to $[1, -1]'$.

The subsequent large empirical literature on the EHTS has expanded in different directions. Hamilton (1988) and Sola and Driffill (1994) were among the first who examined US treasury bills allowing not only for both short- and long-term interest rates to be non-stationary, but also for changes in regime. The evidence provided by these authors support the EHTS. Within a panel framework, Holmes, Otero, and Panagiotidis (2011) provide evidence in favour of stationarity for Asian interest rate spreads. Seo (2003) observes that the presence of transaction costs in financial markets may prevent investors from taking advantage of arbitrage opportunities. Given the latter, the estimation of a threshold vector error correction (VEC) model which allows for nonlinear adjustment to the long-run equilibrium relationship leads this author to provide evidence for nonlinear mean reversion in the term structure of interest rates. Bams and Wolff (2003), in contrast, resoundingly reject the expectations hypothesis for a full data panel of US Treasury securities, using data from 1970:1 to 1994:12 and argue in favour of mean reversion in the US risk premia. More recently, Weber and Wolters (2012) estimate reduced-form bivariate VEC models of the US term structure which allow them to conclude that premia persistence increases with longer-rate maturity. These authors argue that the weight of news is lower for longer horizon investment. Weber and Wolters (2013) document two stylised facts of the US term structure: (i) low contemporaneous cross correlations and (ii) slower adjustment to the underlying long-run equilibrium relationship. Reviewing the literature on the link between the term structure and the macroeconomy, Gürkaynak and Wright (2012) conclude that in the models that explain deviations from the EHTS using time-varying risk premia, inflation uncertainty seems to play the dominant role. Lastly, in a study of Japan, Kagraoka and Moussa (2013) find support for the EHTS during the period of quantitative easing of Japanese monetary policy.