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Beauty Contests and the Term Structure

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The term structure of interest rates prices the cost of borrowing at different horizons. It is typically upward-sloping, with empirical estimates suggesting that the term premium on 5-year US Treasury Bills 1999-2017 has been in excess of 50 basis points. Quantitative asset pricing models have difficulty generating term premia anything like this, with the average term premia on default-free 5-year zero-coupon bonds in medium-scale macro-finance models typically coming out at around one basis point, one if not two orders of magnitude smaller than observed in the data.

This paper presents a new decomposition that stresses the importance of informational assumptions for the emergence of sizeable term premia in asset pricing models. Based on the law of total covariance, we show that real term premia in macroeconomic models contain a component that depends on covariances of realised stochastic discount factors and a component that depends on covariances of expectations of those stochastic discount factors. The impact of different informational assumptions can then be identified by looking at their effect on the second, expectational, component.

If agents have full information about technology in a simple macro-finance model then the conditional covariance of expectations is low, which contributes to the real term premia implied by the model being too small, a result that is unchanged if some components of technology are unobservable or observed with noise. To generate realistic term premia, we draw on the beauty contest literature by differentiating between private and public information and introducing the possibility of strategic complementarities in the formation of expectations. A quantitative version of the model is found to explain a significant proportion of observed term premia when estimated using data on expectations of productivity growth from the Survey of Professional Forecasters.