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Interest rate spreads as predictors of German inflation and business cycles

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Abstract

We have studied the comparative performance of a number of interest rate spreads as predictors of the German inflation and business cycle in the post-Bretton Woods era. The two-regime Markov-switch model that we used as a nonlinear filter allows the dynamic behavior of the economy to vary between expansions and recessions in terms of duration and volatility. We found that the bank term structure, the public term structure, and the spread based on the call rate predicted all recessions with a comfortable lead, although they lagged some of the recoveries by a few months. The bank–public spread generates a series of false signals, and missed completely the upturn in the mid-1970s, but detected the last two recoveries with an average lead of nearly 12 months. The source of the predictive power of interest rate spreads lies in the information they contain not only about monetary policy, but also about an assortment of general macroeconomic shocks. The filter probabilities from three of the interest rate differentials also foreshadowed the long swings in the German inflation rate remarkably well, with a lead time of 2–4 years without any false signals. © 2000 International Institute of Forecasters. Published by Elsevier Science B.V. All rights reserved.

Keywords: Turning-point forecasts; Markov-switch model; Bundesbank policy; Term structure; Germany

1. Introduction

In recent years a number of studies have examined the usefulness of spreads between yields on long-term and short-term financial instruments as predictors of future output growth and inflation. Bernanke (1990), Fama (1990), and Friedman and Kuttner (1993, 1998), among others, have established the predictive power of various interest rate differentials in VAR-based models for US output growth, using the concept of Granger causality. Harvey (1991) and Sauer and Scheide (1995) applied a similar methodology to German data, and offered evidence that the slope of the yield curve (i.e. the difference between yields on long-term and short-term assets) contains useful information for predicting business cycle fluctuations over and beyond what is contained in real money measures. Harvey (1991) showed that forecasts of German output growth based on the term structure of interest rates outper-

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form consensus forecasts of the five leading German research institutions.

The aforementioned papers have a drawback in that they do not distinguish between recessions and economic booms in an explicit way for the purpose of business cycle prediction. Estrella and Hardouvelis (1991), Dueker (1997), Dotsey (1998) and Estrella and Mishkin (1998) have used a probit model with a dummy dependent variable representing recessions to establish the superiority of the spread between long-term and short-term Treasury bond rates in forecasting US recessions. Estrella and Mishkin (1997) and Funke (1997) used these interest rate differentials to demonstrate that a similar relationship holds for the German business cycle. Bernard and Gerlach (1996) also applied the probit methodology to a sample of eight countries including Germany and the US and found that the spread provides useful information about the likelihood of future recessions as far as 2 years ahead. The predictive power was highest for Germany followed by Canada and the US. The authors also showed that a leading indicator constructed by the OECD contains information beyond that of the spread only for horizons of less than two quarters.

Both the VAR and the probit methodologies suffer from the problem of having to choose a fixed lead time with which the spreads indicate shifts in the business cycle, and to restrict this lead to be the same for all peak and trough turning points. The probit model, in addition, relies on ex post realized recession dates to examine the performance of the interest rate spreads, so its predictions greatly depend on the choice of business cycle dating. As noted by Stekler (1991), the process of predicting turning points of regimes is different from making quantitative predictions; consequently, forecasting methods designed exclusively to predict regime changes have been developed. The regime-switch approach adopted by Lahiri and Wang (1994) and Layton (1996) avoids these pitfalls, since it uses a Markov-switch model to generate ex ante forecasts for points of transition between the regimes of recession and expansion. These probability forecasts are then compared to the existing business cycle dating to establish the accuracy of prediction. Lahiri and Wang (1996) also applied the Markov-switch methodology to various US interest rate differentials and found that the framework allows reliable predictions of both recessions and recoveries with comfortable lead times.[1] In the case of Germany the Markov-switch methodology using interest rate spreads has the added advantage that its predictive performance is much less likely to be affected by the structural break associated with German unification in 1990 than the traditional VAR models (cf. Harvey, 1991). In this paper we follow Lahiri (1996) and examine the ability of yield spreads of various German financial instruments to predict the turning points of the German business cycle using the two-regime Markov-switch model as the filter. The resulting turning-point predictions are then compared to the comprehensive recession dating provided by the Economic Cycle Research Institute (ECRI) under the Directorship of Geoffrey Moore.

The use of interest rate differentials for inflation forecasts also has precedence in the literature. Using the classic Fisher (1930) equation and the rational expectations hypothesis, Mishkin (1990a,b, 1991) and Jorion and Mishkin (1991) showed that the spreads between long-term and short-term rates are good predictors of future inflation. Gerlach (1997), Schich (1996), Davis and Fagan (1997), and Estrella

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[1] Dueker (1997) combines a probit model with the Markov-switching methodology. Ahrens (1999) also applies the regime switching approach to predict US recessions. He finds that the yield curve is a reliable predictor.

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