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A nonparametric model for analysis of the EURO bond market

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Abstract

The goal of this paper is to analyse by statistical methods the positions of individual countries within the EURO bond market. To this purpose we assume that each of the individual yield curves equals the sum of a common effect curve and of a country-specific one, interpreted as a spread. This allows to analyse the position of the countries by a two-stage nonparametric regression model. In addition, we provide a nonparametric bootstrap test. Both the estimated regression curves and the test indicate significant differences among European Monetary Union countries. A method for quantification of these differences is designed. © 2002 Elsevier Science B.V. All rights reserved.

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1. Introduction

On January 1, 1999, the third phase of the European Monetary Union (EMU) began with the introduction of the single European currency. The period between January 1, 1999 and December 31, 2001 represents a period of transition, in which the local currencies remain active at fixed exchange rates. From January 1, 2001 to the end of February, 2002 we will see the circulation of Euro and local currency to end up on March 1, 2002 with the sole presence of the Euro.

This process of European economic and financial integration started in 1957 with the "Treaty of Rome", but only in 1993, with the "Maastricht Treaty" the different phases of the realization of the EMU were decided. On May 3, 1998 the European

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council decided that 11 countries were eligible for the EMU; Austria, Belgium, Finland, Germany, Ireland, Luxemburg, Netherlands, Portugal and Spain and announced that bilateral parities would be introduced from January 1, 1999 as a transition to Euro. Greece was not eligible whilst UK and Denmark decided to postpone the decision. The 11 countries (EU-11) were selected on different criteria such as prices stability, sustainability of public finance, exchange rate stability, long-term interest rates below a threshold value of 7.8% over a period of two consecutive years. On May 9, 2000 Greece requested the EU Council to join the single currency. On June 19, 2000, the Council, decided that Greece had fulfilled the necessary conditions and therefore this nation was allowed to adopt the single currency from January 1, 2001.

The introduction of the single currency eliminates currency risks among the countries participating in the third stage of EMU, stimulates European capital flows and boosts the integration of the European capital market. However, the effects of the integration in a single currency were evident well before January 1, 1999. In fact, since mid-1995, long-term interest rates in Europe have sharply declined, converging to the lowest levels (Italy from 12% to 7%). Two sets of factors are usually involved to explain this phenomenon: domestic economic fundamentals and financial markets expectations. The domestic economic fundamentals (inflation, inflationary expectations and fiscal performance) have improved significantly in most EU countries. The second line of explanation centres on the role of financial market expectations of EMU. The expectation of the single currency had the effect of narrowing long-term differentials by reducing the forward interest differentials among countries. In Angeloni and Violi (1997) the evolution of the long-term interest rate over time is reported and an evident convergence starting from mid-1995 is shown. At the same time a prudent, less restrictive monetary policy had the effect to reduce the short-term interest rates in countries such as Italy; the reduction of the central bank rate (TUS) started in 1996 and reached 2.5 pp by the end of May 1998. On the contrary, Germany shows an increase in the short-term interest rates. We refer to Buttiglione et al. (1997) for a detailed analysis of the impact of changes in central bank rates on the term structure of interest rates.

The convergence tendencies among the term structure of different countries are further illustrated by Fig. 1 which is the plot of yields of straight government bonds traded on November 25, 1998 on the relevant bond markets of the future EMU countries. The source of the data is Bloomberg.

The disappearance of exchange rate risk and the increased homogeneity among the members of the Euro area, underpinned by increased cross-border competition, have helped to promote a deeper and more liquid EURO bond market. Nonetheless, some factors of segmentation still remain; not to mention the specific country risk, see Stucki (1998) for additional discussions, or the differences in legal and fiscal systems and in traditional financing mechanisms (the corporations in Euroland are gradually moving to a nonbank financing system with a ratio of outstanding bonds as compared to bank loans for nonfinancial corporations increasing from 10% in 1998 to 11.5% in the first half of 2000).

Several studies have analysed the degree of convergence to integration, considering different approaches: D'Amico (1999) analyses the influence of different macroeconomic factors on the differential spreads of different EU countries before January 1,

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