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Journal of Banking & Finance 26 (2002) 2047–2064

Journal of BANKING & FINANCE

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The effects of the introduction of the euro on the volatility of European stock markets

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Received 17 February 2000; accepted 16 March 2001

Abstract

Have convergence of European economies and introduction of the euro produced some effects on European stock markets? Theory suggests that stabilization of fundamentals should decrease variance of stock returns for historically unstable stock markets. We test this proposition with daily data for the period January 1988–May 2000 and apply a three-regime Markov switching model for the variance-covariance matrix among several stock indices, including the UK and the US. The analysis shows that introduction of the euro, after an initial burst of volatility common to all European stock markets, has indeed stabilized the Spanish and Italian stock markets.

JEL classification: C32; F30; G10
Keywords: Present discounted value model; Markov switching model; Stock markets; Euro

1. Introduction

One of the most interesting experiments of capital market integration has taken place in Europe during the last 20 years. The euro has been introduced at the end of a long convergence process beginning in 1979 with the creation of the European Monetary System (EMS). In the few years before the introduction of the euro there

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0378-4266/02/$ - see front matter
PII: S0378-4266(01)00182-0

has been a dramatic acceleration in the convergence process. Italy and Spain have decreased their annual inflation rate by several percentage points in a short time. Italy has been able to introduce a fiscal stabilization plan which has brought the primary surplus to about 5% of gross domestic product and has stopped the increase in the ratio between public debt and domestic product. The short-term nominal interest rate in Italy has decreased from 11% to 3% in only two years. Economic convergence has therefore left concrete signs in the macroeconomic structure of some European countries. The rules included in the 1998 Stabilization Pact are aimed at forcing even more convergence of fiscal deficits and reductions of public debt over the next years.

This paper explores the consequences of the convergence process associated with the introduction of the euro on European stock markets. Has convergence of the European economies been associated with some form of convergence of European stock returns? Economic theory predicts that stock prices should reflect expectations of future dividends, interest rates and risk premia. Therefore the unconditional variance of stock returns should depend on variances and covariances of such fundamentals. It follows that both first and second moments of returns should be affected by the convergence process and the introduction of the euro to the extent that these phenomena affect fundamentals and expectations thereof. In particular, the introduction of the euro should be associated with a reduction of volatility of macroeconomic fundamentals of the historically unstable European economies like Spain and Italy, due to convergence of the stochastic process of fundamentals to that of the more stable northern European economies.

The stabilization of some European stock markets could be studied with standard econometric methods only allowing for the existence of structural breaks. While we will test for a reduction in the unconditional variance of stock returns after the date of the introduction of the euro by means of an F test and of a test regarding the constant in a GARCH(1,1) model, we believe that such tests are insufficient due to the forward-looking nature of investors who may have set (in theory, should have set) prices with an eye towards the future introduction of the euro even before the end of 1998. It follows that econometricians have no knowledge of the exact date when investors have started to incorporate the euro factor in stock prices. A viable econometric alternative is provided by models where the variance switches across states. In such a model the introduction of the euro may be interpreted in terms of a stabilization of the stochastic processes of fundamentals of some European countries. A theoretical model for stock price determination suggests then that such a stabilization should be followed by a reduction in the variance of returns. Notice that simply allowing for the existence of different regimes would not be enough in terms of empirical analysis if we believed that the introduction of the euro has created a new economic regime. However we believe that this is not the case. We do not claim that the euro has allowed a transition of the Italian and Spanish economies towards a volatility regime similar to the one historically prevailing in Germany. Instead we assume that each single European stock market may move across three regimes characterized by different perceptions of the volatility of fundamentals. The stabilization of fundamentals brought about by the introduction of the euro should have