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Economic Systems 28 (2004) 337–352

**ECONOMIC
SYSTEMS**

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Foreign exchange market volatility in EU accession countries in the run-up to Euro adoption: weathering uncharted waters

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Accepted 6 February 2004

Abstract

The paper analyzes foreign exchange market volatility in four Central European EU accession countries in 2001–2003. By using a Markov regime-switching model, it identifies two regimes representing high- and low-volatility periods. The estimation results show not only that volatilities are different between the two regimes, but also that some of the cross-correlations differ. Notably, cross-correlations increase substantially for two pairs of currencies (the Hungarian forint–Polish zloty and the Czech koruna–Slovak koruna) in the high-volatility period. The paper concludes by discussing the policy implications of these findings.

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JEL classification: C10; G10

Keywords: Markov regime-switching model; Foreign exchange market volatility; EU accession countries

1. Introduction

As European Union (EU) membership in 2004 became increasingly certain and macroeconomic stabilization took hold firmly in accession countries, expectations about euro adoption changed substantially bringing about rapid nominal convergence in the lead

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EU accession countries (but not in the accession countries overall) while stimulating convergence trades. Nominal convergence has, however, been anything but straightforward so far in financial markets. Expectations about the time of euro adoption have changed frequently (see, e.g., Csermely, 2004), not least because of changing macroeconomic fundamentals and the unexpected turns of macroeconomic policies. As a result, market volatility has increased and spillovers among certain countries appear to have also become more frequent and stronger.

While market participants and policymakers have increasingly realized this phenomenon (see, e.g., Reuters, 2003a, 2003b; MTI, 2003; TASR, 2003), the nature of these changes has not been analyzed in a formal way. In particular, no quantitative analysis is yet available to answer the question whether increased volatility and spillovers in certain countries and periods are due to an underlying structural change or are an inherent characteristic of these markets that has recently become more visible as market and policy shocks have become more frequent.

The paper aims to shed light on this question by carrying out a statistical analysis of foreign exchange spot markets in four Central European accession countries (CEACs): the Czech and Slovak Republics, Hungary, and Poland. The sample period covers May 2001 to September 2003, when no major exchange rate regime change took place in the countries under investigation.¹ We exclude the Baltic accession countries, because they continued to pursue highly fixed exchange rate regimes during this period.

The paper focuses on identifying periods in foreign exchange markets with different characteristics. The empirical analysis is based on Markov regime-switching models. This methodology allows us to identify separate joint normal distributions for the exchange rates of these countries for periods in which the parameters of these distributions are significantly different. Identifying and better understanding the nature of high-volatility periods and estimating the increases in volatility (standard deviation) and spillovers to other countries (correlations among markets in different countries) will enable policymakers to formulate better policies, including those on prudential regulations, for high-volatility periods.

2. Methodology

When analyzing economic time series, the data-generating process can often be described by shifting regimes characterized by different parameters. Regime-switching models enable us to separate these periods statistically and estimate the probability of an observation belonging to a given regime. The methodological difficulty is that, unlike in the case of a foreign exchange policy regime change which is declared by a central bank, regime changes in financial markets cannot be observed directly, because the regime change itself is treated statistically as a stochastic process. Consequently, we have to

¹ Choosing the sample period this way, we had to exclude some periods of particular interest in this regard in the 1990s, such as the attack on the Czech koruna in 1997. Though it would be interesting to analyze this period separately, we do not undertake this task here because we wish to concentrate on the run-up to the euro adoption.

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