

Contagion Across and Integration of European Emerging Stock Markets: Evidence from Intraday Data

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Abstract

We analyze interrelations between three stock markets in Central and Eastern Europe and, in addition, interconnections which may exist between Western European (DAX, CAC, UKX) and Central and Eastern European stock markets (BUX, PX-50, WIG20). The novelty of our paper rests mainly on the use of the five-minute tick intraday price data from the mid-2003 to the early 2005 for stock indices and on the wide range of econometric techniques employed. We find no robust cointegration relationship for any of the stock index pairs or for any of the extended specifications. There are signs of short-term spillover effects both in terms of stock returns and stock price volatility. Granger causality tests show the presence of bidirectional causality for returns as well as volatility series. The results based on a VAR framework indicate a more limited number of short-term relationships between the stock markets. In general, it appears that spillover effects are stronger from volatility to volatility than contagion effects from return to return series.

Keywords: contagion and spillover effects, market integration, European emerging markets , intra-day data

Stock markets in Central and Eastern Europe (CEE), especially those in Budapest, Prague and Warsaw, underwent some remarkable developments both in terms of market capitalisation and daily trade volumes from the very beginning of the economic transformation. Although the financial system of these countries largely remains bank dominated, the stock exchanges appear to be well integrated with world financial markets following the lifting of restrictions on portfolio capital movements. The evidence in the literature is pre-dominantly based on data with daily or even lower frequencies. The developments in volatility and contagion effects that materialize during the trading day represent a finer picture but has not been researched in these markets so far.

The article looks at the links and possible spillover effects for stock returns and stock volatilities among markets in Budapest, Prague and Warsaw. Their interactions with selected major markets in the EU are studied, too. This is done on the basis of intraday data recorded in five-minute intervals for the period from mid-2003 to early 2005. To study links between the individual stock indices several techniques are adopted. First, pair-wise cointegration tests between the CEE stock indices and between the individual stock indices and their three Western European counterparts are performed. In addition, a cointegration relationship including all three CEE stock indices and one Western European stock index has been analysed as well. In a second stage, short-term interactions between the stock markets are investigated by conducting pair-wise Granger causality tests between indices and their volatilities. Finally, possible spillover effects are investigated using a vector autoregressive framework.

The findings indicate the following:

- no robust cointegration relationship could be established for any of the stock index pairs or for any of the extended specifications.
- there are short-term spillover effects both in terms of stock returns and stock price volatility
- in general, spillover effects are stronger from volatility to volatility as compared to contagion effects from return to return series.

The evidence indicates that developments in volatility and contagion effects that materialize during the trading day differ from those that found in aggregate data. Such findings are robust due to several techniques used.