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# Determinants of European stock market integration

David Büttner, Bernd Hayo\*

Faculty of Business Administration and Economics, Philipps-University Marburg, Universitätsstr. 24, 35032 Marburg, Germany

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### ABSTRACT

We analyse the determinants of stock market integration among EU member states for the period 1999–2007. First, we apply bivariate DCC-MGARCH models to extract dynamic conditional correlations between European stock markets, which are then explained by interest rate spreads, exchange rate risk, market capitalisation, and business cycle synchronisation in a pooled OLS model. By grouping the countries into euro area countries, “old” EU member states outside the euro area, and new EU member states, we also evaluate the impact of euro introduction and the European unification process on stock market integration. We find a significant trend toward more stock market integration, which is enhanced by the size of relative and absolute market capitalisation and hindered by foreign exchange risk between old member states and the euro area. Interest rate spreads and business cycle synchronisation are also significant factors in explaining equity market integration.

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## 1. Introduction

The integration of financial markets is important to both market participants and policymakers. In integrated markets, capital flows freely to where it will generate the highest return. Integrated financial markets have easier access to foreign capital, but are also more vulnerable to financial crises occurring in other areas of the world. Moreover, any increase in the degree of global financial market integration decreases the opportunity for diversification. It is thus essential to achieve a better understanding of the factors driving financial market integration. In this study, we analyse determinants of stock market integration from 1999 to 2007 using data from European Union (EU) member states. To assess the impact of political factors on financial market integration, we group the

\* Corresponding author. Tel.: +49 0 64 21 28 23 091; fax: +49 0 64 21 28 23 088.

E-mail address: [hayo@wiwi.uni-marburg.de](mailto:hayo@wiwi.uni-marburg.de) (B. Hayo).

URL: <http://www.uni-marburg.de/fb02/makro>

countries based on their European integration status into euro area countries (EMU), old EU member states without the euro (OMS), and new EU member states (NMS).<sup>1</sup>

Although there are many studies analysing the evolution of stock market integration over time, few authors attempt to disentangle the driving factors behind this process. Recently, the impact of European political and economic integration on European stock market integration has been studied more intensively.

Kim et al. (2005) analyse the impact of EMU on stock market integration by estimating time-varying conditional correlations between the stock market returns of member states and euro area weighted aggregate returns.<sup>2</sup> They use a bivariate EGARCH framework over the period January 1989 to May 2003. The authors find that EMU unidirectionally causes a shift to higher European stock market integration. Moreover, they search for further causes of stock market integration, e.g. foreign exchange rate volatility, output correlations and seasonal effects. However, only financial market sophistication measures yield statistically significant results.

Kenourgios et al. (2009) examine the integration in European (euro area, central Europe and the Balkans) equity and bond markets from January 1997 to October 2006. They use a modified version of the asymmetric generalized dynamic conditional correlation (AG-DCC) and discover an increase in integration during the period of the dotcom collapse in 2000, the start of negotiations on EU membership with the Balkan countries in 2000, the entry of the euro into circulation in 2002, and the entry of CE countries into the European Union in 2004. Additionally, they find an increase in integration of the euro area, central European and Balkan countries over time.

Covering the period from January 1986 to June 2000, Fratzscher (2002) examines the impact of EMU on financial market integration. Within a GARCH framework he finds that European equity markets have become highly integrated only since 1996 and that the elimination of exchange rate risk associated with the creation of EMU can explain a large part of financial market integration.

Erb et al. (1994) investigate G-7 cross-country stock exchange correlations from 1970 to 1993 and discover that correlations are lower when the business cycles of two countries are out of phase and when they are simultaneously experiencing a growth period. In contrast, during recessions correlations are higher.<sup>3</sup>

Using extreme value theory and monthly index return data from 1959 till 1997 for the US, UK, Germany, France, and Japan, Longin and Solnik (2001) find that the correlation increases in bear markets but not in bull markets and is unrelated to market volatility.

Pretorius (2002) finds the inverse of industrial production growth differentials and trade linkages to have a positive impact on bilateral correlations of 10 emerging stock markets over the period of 1995 until 2000. While other factors, such as inflation differentials, interest rates, stock market size, market volatility, and a time trend do not appear to play a major role, there is a positive impact on correlations for countries belonging to the same region.

Summing up, the empirical evidence for the impact of European political integration on financial market integration is stronger than the evidence for the influence of macroeconomic factors.

Our study adds various new elements to the literature: First, it differentiates countries according to their level of European integration. Second, it includes new member states which joined the EU in 2004. Third, in contrast to other studies (such as Kim et al., 2005), we estimate bilateral dynamic

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<sup>1</sup> Members of the groups are: (1) Euro area: Austria, Belgium, Finland, France, Germany, Ireland, Italy, The Netherlands, Portugal, and Spain. Greece is not included, as it introduced the euro only in 2001, nor is Luxemburg, as its markets are small. (2) Old EU member states outside the euro area: Denmark, Sweden, and The United Kingdom. (3) New EU member states: the Czech Republic, Hungary, and Poland. These countries were chosen because they have not yet introduced the euro, but have sufficiently large financial markets.

<sup>2</sup> Using a regime-switching model, Baele (2005) shows that European integration had a positive effect on European stock market volatility spillovers in the 1980s and 1990s. Bartram et al. (2007) and Capiello et al. (2006) find a positive effect of EMU on stock market interdependence. In their study of the correlations between spot and futures stock markets in France, Germany and the UK, Antoniou et al. (2003) show that correlations among French and German markets are higher than with their UK counterparts. Savva et al. (2009) confirm the positive impact of Euro introduction on stock market correlations among France and Germany.

<sup>3</sup> Croci (2004) also looks at the impact of European macroeconomic convergence on integration of German, French, Italian and Spanish financial markets over the period of January 1994 through June 2004, yielding mixed results. She uses three different measures, inter alia DCC-MGARCH.

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