Journal of Empirical Finance 38 (2016) 429–448

Contents lists available at ScienceDirect

Journal of Empirical Finance

journal homepage: www.elsevier.com/locate/jempfin

Time-varying importance of country and industry factors in European corporate bonds☆

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ARTICLE INFO

Article history:
Received 30 May 2015
Received in revised form 21 December 2015
Accepted 11 January 2016
Available online 21 January 2016

JEL classification:
G12
G15
F36

Keywords:
Market integration
Corporate bond markets
Factor decomposition
Sovereign debt crisis

ABSTRACT

In this paper we study financial integration in Europe by looking at the time-varying relative importance of country versus industry factors in the European corporate bond market. Using a unique dataset that is representative for the universe of actively quoted corporate bonds, we find that although unconditionally the country factor dominates the industry factor, there is substantial time variation and no trend towards full integration. Breaks in the variation correspond with several important events in the European financial market integration, such as the introduction of the Euro and the sovereign debt crisis.

1. Introduction

The process of financial integration in Europe has experienced a number of major events over the past decades. On the one hand, the Economic and Monetary Union (EMU) with the introduction of the Euro is a ground-breaking step towards more financial integration. On the other hand, the recent global financial crisis and the European sovereign debt crisis have challenged the integration process. The state of financial integration is important for both policy makers and market practitioners in the Eurozone alike. For these reasons, financial integration studies have grown into a distinctive field in the international finance literature. This paper contributes to that field by bringing the perspective from the European corporate bond market. Furthermore, this study is to the best of our knowledge the first to bring such an analysis into the territory of time-varying country and industry exposures as well as the global financial crisis.

There are several ways to measure financial integration. In this paper, we study the financial integration process in Europe by looking at the relative importance of country versus industry factors. If the relative importance of country factors decreases

☆ We are especially grateful for the helpful comments and suggestions from the anonymous referees. We thank the participants of the European Sovereign Debt Crisis conference, with special thanks to our discussant Evren Örs. We also thank our discussants at the Infiniti Conference, the FMA Europe conference, the EFMA conference, and the Brownbag Seminar in Erasmus University.

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http://dx.doi.org/10.1016/j.jempfin.2016.01.010
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(increases), it can be interpreted as market integration (fragmentation). The benchmark study we build on is by Heston and Rouwenhorst (1994) who introduce a factor decomposition model, and Baele et al. (2004a,b) who apply the model in the market integration framework. Many studies that follow a similar approach show by and large that industry factors play an increasingly larger role relative to country factors in the stock market.[1] In Europe, this is especially the case after 2000, which coincides with the introduction of the Euro. Corporate bond market studies, however, have been far less prevalent. Given that the European bond market is substantially larger than the European equity market[2], it is of critical importance to gain more insight on the state of financial integration from this market. The bond studies that do exist lend mixed evidence on the relative importance of country and industry factors.[3] These results raise the impression that the corporate bond market offers a distinct and different perspective on financial integration in Europe compared to the stock market.

Our paper contributes to the field of European financial integration studies by making the perspective from the bond market more detailed and complete. We do so by hand-collecting a comprehensive dataset of the European corporate bonds that spans more than two decades, and by introducing time-varying country and industry exposures. The first specific contribution of this paper is that we introduce a straightforward modification of the Heston and Rouwenhorst (1994) decomposition model to allow for bond-specific and time-varying factor exposures. This enables us for the first time to study how the financial integration process evolves among European countries from a corporate bond market perspective. The method we use to make factor exposures time-varying is a multivariate GARCH specification. A second specific contribution of this paper is that we examine the impacts of several critical events including the start of EMU and the recent financial crisis on the process of financial integration in Europe. Through a rolling-window break point analysis, we let the data identify the events that significantly change the level and the trend of the integration process.

We find that the corporate bond markets tell a different story from the stock market on financial market integration in Europe. Unconditionally, country factors dominate industry factors. We observe that the importance of country factors decreases after the launch of EMU, although they still remain dominant relative to industry factors. They become even more important after the global financial crisis despite years of financial integration in the monetary union. Evidently, integration is far from complete in the European corporate bond markets and EMU is not quite the leap forward for integration as it is for stocks. We also find that the relative importance of country and industry factors changes significantly over time. Likelihood ratio tests indicate that our model significantly improves over the static specification for over 95% of the bonds in our sample. This confirms that there is considerable time-variation in the country and industry exposures of European corporate bond returns, as is true for stock returns. Our break point analysis identifies five dates at which the level and the slope of the country and industry factor loadings change significantly. The identified dates coincide with the signing of the Maastricht Treaty, anticipation and introduction of the Euro, the global financial crisis and the European debt crisis. Country factor importance is reduced relative to the industry factors after 1999. This indicates that EMU fosters financial integration at first when the industry composition of countries also becomes more specialized. However, after the global financial crisis in 2007, country factors regain their importance in explaining bond returns over industry factors. This indicates that this major shock is a large setback to integration, leading to financial fragmentation in the Eurozone. Integration, therefore, is a dynamic process that does not follow a simple linear path towards full integration.

Additional analyses using classified country groups show that the core, periphery, and non-Euro countries in our sample experience different integration paths. Our results show relatively similar trends for core and peripheral countries across time. However, Germany and The Netherlands show larger impacts from the crisis. This might be due to the sovereign debt fears in EMU igniting a flight to safety to the core countries during the crisis. The non-Euro countries in our sample show different trends than the Euro countries, suggesting that the integration process is indeed affected by the adoption of the Euro. A possible explanation is that in this period the business cycle of these EMU opt-outs diverges considerably from that of the Eurozone. Our results are robust to the exact model specification, excluding the largest country (Germany) and excluding the most influential industry (Financial and Funds).

The rest of the paper is organized as follows. Section 2 places the contribution of our paper in the existing literature and develops six main hypotheses. Section 3 explains how we prepare the data and gives the summary statistics of our final bond sample. In Section 4 we outline the main methods that we employ for our study. We discuss our main findings in relation to our hypotheses in Section 5. In Section 6 we conduct two additional tests, excluding the most dominant country (Germany) and most dominant industry (Financial and Funds) from our sample. The final section concludes the paper.

2. Literature and hypotheses

2.1. Background literature

Our paper relates and contributes to several streams of literature. The first stream of related studies is about financial integration. There are numerous studies that measure to what extent stock markets are integrated in Europe. They differ in quantifying integration by using price measures (e.g. Fratzscher, 2002; Adjaouté and Danthine, 2004;

[1] See e.g. Baca et al. (2000), Cavaglia et al. (2000), Adjaoute and Danthine (2003), Flavin (2004), Phylaktis and Xia (2006).
[2] See BIS (2015) and World Federation of Exchanges (2015).
[3] See e.g. Varotto (2003), Pieterse-Bloem and Mahieu (2013) and Baele et al. (2004a,b).