



Determinants of yield spread dynamics: Euro versus US dollar corporate bonds[☆]

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ABSTRACT

This paper presents a systematic comparison between the determinants of euro and US dollar yield spread dynamics. The results show that US dollar yield spreads are significantly more affected by changes in the level and the slope of the default-free term structure and the stock market return and volatility. Surprisingly, euro yield spreads are strongly affected by the US (and not the euro) level and slope. This confirms the dominance of US interest rates in the corporate bond markets. Interestingly, I find that liquidity risk is higher for US dollar corporate bonds than euro corporate bonds. For both regions, the effect of changes in the bid-ask spread is mainly significant during periods of high liquidity risk. Finally, the results indicate that the credit cycle as measured by the region-specific default probability significantly increases US yield spreads. This is not the case for euro yield spreads.

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1. Introduction

The behavior of corporate yield spreads has recently received much attention from practitioners, financial regulators, and academics. Important issues that have been addressed are: How much of the spread changes between corporate and government yields can be explained by default and liquidity risk? Which macro-economic factors significantly affect movements in corporate yield spreads? Because the US has a large and mature corporate bond market, most empirical studies concentrate on US dollar corporate yield spreads (e.g., Longstaff and Schwartz, 1995; Duffee, 1998; Collin-Dufresne et al., 2001; Elton et al., 2001; Huang and Huang, 2003; Cremers et al., 2006 amongst many others). Relatively few studies have examined the determinants of euro corporate yield spreads (e.g., Boss and Scheicher, 2002).¹ However, over the last decade, the euro corporate and government bond markets have expanded considerably. The euro has displaced the US dollar as the world's pre-eminent currency in international bond markets. Even

though governments are still the main issuers of debt within the EMU area, the growth has been mainly driven by a sharp rise in euro bond issuance by companies and financial institutions.

This paper investigates and systematically compares potential determinants of euro and US dollar yield spread changes for investment grade bonds. Several factors make it interesting to investigate the differences in spread dynamics between both markets, of which liquidity risk and the composition of the bond markets are arguably the most important. The US dollar corporate bond market has a longer history and is larger both in terms of market share and number of bonds than its European counterpart. However, with the expansion of the euro bond market, liquidity of its secondary markets has substantially improved. Differences in the composition between the euro and US dollar corporate bond markets mainly reflect differences in financial structure. Even though continental Europe has historically been mainly bank-based and the US mainly market-based, European companies are slowly moving away from their traditional reliance on bank loans. The creation of a single currency and the harmonization of bond market conventions within the euro area have allowed the development of a larger and more liquid 'euro' market. At the start of the EMU, the majority of corporate bonds were issued by the financial-sector and of high credit quality. As the euro bond market has become more important, the proportion of A-rated and BBB-rated corporate bonds has grown sharply. The composition of US corporate bond market is quite different. Only few bonds are rated AAA and the proportion

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¹ In the remainder of this paper, euro bonds refers to euro-denominated bonds and US dollar bonds to US dollar-denominated bonds. Similarly, euro yield spreads refers to yield spreads on euro-denominated bonds and US dollar yield spreads to yield spreads on US dollar-denominated bonds.

of different rating categories has been relatively stable over the last decade. The key question is whether the structural differences between both markets are reflected in their respective yield spread dynamics.

This paper analyzes the effect of default risk factors derived from structural models and investigates the liquidity of both markets as well as the effect of liquidity risk on yield spreads. In addition, it analyzes the impact of the credit cycle measured by the average region-specific default probability and the effect of differences in the taxation systems on yield spreads. The euro and US dollar term structures of corporate yield spreads are estimated by rating and sector and obtained using an extension of the Nelson–Siegel model. This allows me to systematically compare corporate yield spreads by region. The data set consists of monthly observations of bid and ask yields for 1761 euro corporate bonds issued by 540 companies in the EMU zone and 3571 US dollar corporate bonds issued by 695 US companies.

The main empirical findings of the paper are as follows: First, US dollar yield spreads are significantly more affected by changes in the level and the slope of the default-free term structure than euro yield spreads. This finding is mainly driven by the fact that euro financial-sector bonds, which dominate the euro sample, are less sensitive to interest rate changes. Although counter-intuitive at first, the empirical findings suggest that the euro financial-sector is different from the US financial-sector. A possible explanation is that owing to a still strong reliance on bank intermediation in continental Europe, the euro financial-sector is still the main source of funding and therefore less affected by the level and the slope of the default-free term structure. Surprisingly, the relationship between the euro yield spreads and the US level and slope is significant and strong, whereas the relationship between euro yield spreads and the euro level and slope is weak and often not significant. This indicates that US interest rates (still) dominate bond markets. Second, US dollar yield spreads are substantially more affected by the S&P500 return and volatility than euro yield spreads by the DJ Euro Stoxx return and volatility. This finding, which holds for both financial-sector and industrial-sector bonds, indicates that the S&P500 is seen as a more important and meaningful indicator for the US bond market than the DJ Euro Stoxx for the euro bond market. At the same time, the S&P500 does not significantly impact euro yield spreads once the DJ Euro Stoxx is taken into account. Furthermore, I find a significant and nonlinear relationship between yield spreads and stock market volatility. Third, changes in liquidity risk (measured as the average bid-ask spread) contribute a significant fraction of euro and US dollar yield spread changes. The relationship, which is positive and significant, is inversely related to the credit quality of the bonds and mainly significant during periods of high liquidity risk. Interestingly, the average bid-ask spreads by rating are higher for US dollar than euro corporate bonds, which indicates that liquidity of the euro corporate bond market is better. Finally, the empirical results provide evidence that taking into account changes in the credit cycle significantly improves the results for US dollar yield spreads. The effect of the credit cycle, which is proxied by the time-varying region-specific default probability, is especially prominent during recessions. Depending on the rating, the model explains between 35% and 50% of the variation in yield spreads as measured by the adjusted R^2 .

The paper is organized as follows: Section 2 describes the main characteristics of the euro and US dollar corporate bond data. Section 3 gives an overview of the methodology to extract spot rates and discusses the term structure of euro and US dollar yield spreads. Section 4 presents the empirical analysis of the determinants of yield spread changes and briefly discusses some robustness checks. Finally, Section 5 concludes.

2. Data description

2.1. Corporate bond yields and swap rates

The euro and US dollar default-risky term structures are estimated using a data set of monthly investment grade corporate bond yields.² The data set covers the period July 1999–September 2006 and includes mid, bid, and ask yields. The euro and US dollar corporate bonds in question are included in the Merrill Lynch (ML) euro and US dollar Corporate Broad Market Indices, respectively. These indices are based on secondary market prices of bonds denominated in US dollar and euro or one of the currencies that joined the EMU, respectively. Prices are Bloomberg generic (BGN) prices, which are provided by Bloomberg when there are at least five price contributors to a particular bond. The BGN price of a bond is generated by truncating the extremes and averaging the remaining quotes. The data set excludes Bloomberg fair value (BFV) prices. The latter are generated for unpriced bonds by a proprietary optimization. To be included in the ML Corporate Broad Market Indices bonds must be rated investment grade. Hence the analysis is restricted to corporate bonds rated BBB– and higher. Furthermore, euro and US dollar corporate bonds should have a minimum amount outstanding of euro 100 million and US dollar 150 million, respectively. Because of their relatively low minimum size requirements, the ML indices provide a broad coverage of the underlying markets. The indices are re-balanced on a monthly basis.

Several filters are imposed to construct the sample of bonds. For euro (US dollar) yield spreads the attention is restricted to bonds issued by EMU (US) companies. 91% of the US dollar bonds in the sample are issued by US companies, whereas only 78% of the euro bonds are issued by EMU companies and another 20% by US companies. This could potentially bias the relationship between euro yield spreads and region-specific explanatory variables. Callable, puttable, sinking fund, and convertible bonds are eliminated from the sample. To ensure that the analysis only includes corporate bonds backed solely by the creditworthiness of the issuer, covered bonds (Pfandbriefe and non-Pfandbriefe covered), securitized bonds (e.g., asset-backed and mortgage-backed securities), and quasi and foreign government bonds are also eliminated. The data set only includes bonds with at least one year remaining to maturity. Furthermore, bonds should have at least 12 monthly observations. To filter out potential pricing errors, bonds with negative yield observations are removed. This leaves me with a data set of 1761 euro corporate bonds issued by 540 entities and 3571 US dollar corporate bonds issued by 695 entities.

The swap curve is used as the default-free term structure to calculate yield spreads. The choice of benchmark curve is mainly driven by the fact that the swap curve is increasingly used as a risk-free benchmark by financial institutions. Feldhütter and Lando (2007) conclude that the riskless rate is better proxied by the swap rate than the Treasury rate for all maturities. In this paper, the euro swap curve is bootstrapped using the 12 month Euribor and 2–10 year maturity euro swap rates. The US swap curve is bootstrapped using the 6 and 12 month US LIBOR and 2–10 year maturity US swap rates. As the US swaps involve semi-annual payments, I first interpolate between the swap rates at intervals of six months.

2.2. Bond characteristics

Besides bond yields, the data set contains information on rating performance over time, the industry classification, the coupon rate, the time-to-maturity, and the amount issued. Ratings are compos-

² Even though the share of high-yield or speculative grade euro bonds has increased over the last decade, the distribution of the bond issuance shows that the majority are still investment grade.

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