Risk Factors for Corporate Bond Returns in the Euro Area

Gustav Finne

Hanken School of Economics

ABSTRACT

I examine the cross-sectional drivers of corporate bond returns in the euro area using data from January 2002 to October 2020. With rising levels of bond financing in the currency bloc, I provide out-of-sample evidence for recently introduced characteristics of bond risk such as downside, credit, and liquidity risk. I find that many of these characteristics are associated with cross-sectional variation in returns and that downside risk exposure yields premiums in excess of established factors. I introduce a new risk characteristic to capture bonds' sensitivity to monetary policy intervention and find evidence that it explains variation in expected returns at the bond and portfolio level.

JEL classification: G11, G12

Keywords: Corporate bonds, risk factors, euro area, monetary policy risk

Introduction

While the size of the corporate bond market is growing fast in the euro area (Darmouni and Papoutsi, 2020), in 2018, it was still at approximately one-sixth of that in the U.S. The euro area also lacks a transparent source of pricing information for corporate bonds that makes the market more accessible for researchers such as the U.S.'s Trade Reporting and Compliance Engine (TRACE). In this paper, I fill a gap in the literature by providing out-of-sample evidence for bond pricing factors that were recently introduced in the U.S. setting. I also introduce a new risk factor that seeks to capture bonds' exposure to changes in the stance of monetary policy. As the central bank acquires a larger share of the outstanding bonds, investors could potentially re-calibrate their pricing models to factor in risks inherent in the availability of financing that are dependent on progress towards monetary objectives.

Motivation

The paper has **two main motivations:**

1. One and the most important is to propose a **monetary policy risk factor (MPF)** that seeks to capture bonds' exposure to unexpected innovations in the stance of monetary policy. There are at least three reasons why the corporate bond market in the euro-area could be an attractive setting to measure this exposure:
   - First, the scope of monetary policy intervention in the euro area has surpassed the U.S.'s with its direct purchases of corporate bonds through the corporate sector purchase programme (CSPP). The amount held across all asset purchase programs now constitutes a larger fraction of the market as compared to the U.S.
   - Second, the target interest rate in the euro area has been at or below zero since July 11, 2012, and open market operations with asset purchase programs has been the main tool for monetary policy. Hence, innovations in the stance of monetary policy can be measured from changes in holdings of securities for monetary policy purposes.
   - Third, policy-makers have significantly expanded the scope of the collateral framework in the euro area since the introduction of the euro (Nyborg, 2016, Chapter 3). The framework seeks to ensure that financing conditions improve via the bank lending channel possibly supporting the lost business from a transition with more bond financing from the CSPP (Grosse-Rueschkamp, Steffen, and Streitz, 2019). Hence, the lending conditions of banks can be correlated to those in the corporate bond market as the central bank's monetary policy transmits via both channels.
2. The second is to provide **out-of-sample evidence** for the bond pricing factors recently introduced in the U.S. setting.

Data

I screen Refinitiv's database to obtain the characteristics of the Eurosystem's corporate bond holdings. I then pass the unique characteristics of these holdings as filters and rescreen the database. After filtering based on the methods used in the literature, I obtain a sample of **200,694** bond-month observations for **4,401** bonds. The median return amounts to approximately **3.1%** per annum. A value-weighted portfolio of all bonds in the sample (MKT) has an annualized standard deviation of **4.1%**.

The Monetary Policy Risk Factor

Using data on the amount of securities held for monetary policy purposes from June 2009 to October 2020, I generate a series of innovations in the stance of monetary policy and measure the sensitivity (β^{MP}) to that series for each bond in the sample, controlling for the bond market exposure. A proportion of the changes in the stance is certainly priced in, but a measure of sensitivity to monetary policy innovations is captured by the absolute value of the exposure to the series. Other ways of measuring the exposure to monetary policy includes the monetary policy uncertainty index of Husted, Rogers, and Sun (2016) that is based on the economic policy uncertainty index of Baker, Bloom, and Davis (2016). These measures rely on the relative level of coverage of uncertainty in newspaper articles while the introduced measure seeks to capture investors' sensitivity to innovations in monetary policy.

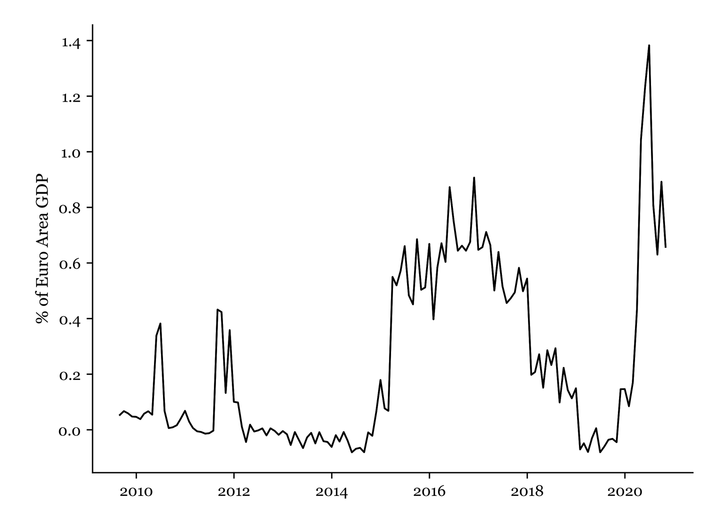

Figure 1. Monthly Rate of QE

The bond-level β^{MP}s are estimated using 36-month rolling regressions of:

$$r_{i,t} - r_{f,t} = \alpha_{i,t} + \beta_{i,t}^{MP} \Delta QE_t + \beta_{i,t-1}^{MP_{lag}} \Delta QE_{t-1} + \beta_{i,t}^{MKT} MKT_t + \epsilon_{i,t}. \quad (1)$$

Based on the introduced measure, I examine the hypothesis that investors can earn a premium for holding bonds that are more exposed to monetary policy innovations. The **MPF** is produced by trivariate $3 \times 3 \times 3$ conditional sorts on β^{MP}s that control for subtertiles on credit ratings and time to maturity. I use three benchmark models to test the performance of the portfolios. The **stock model** contains Fama and French (1992) factors with their momentum factor, and the Pástor and Stambaugh (2003) liquidity factor. The **bond model** consists of Fama and French (1993) TERM and DEF factors. The **combined model** comprises the stock and bond factors. Table I presents the performance of the trivariate portfolios formed on β^{MP}s as well as the long–short porfolio (3 – 1).

Table I

Trivariate Portfolios on β^{MP}s

The Newey and West (1987) *t*-statistics are reported in parentheses. The ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Average β^{MP}	Average Return	Stock Alpha	Bond Alpha	Combined Alpha
β^{MP},1	0.52	0.30	0.16	0.09	0.08
		(3.42)	(1.65)	(2.04)	(1.99)
β^{MP},2	1.72	0.33	0.20	0.14	0.13
		(3.96)	(2.13)	(3.18)	(3.12)
β^{MP},3	4.74	0.47	0.31	0.23	0.23
		(4.26)	(2.89)	(4.10)	(5.20)
3 – 1	4.21***	0.17***	0.15***	0.15***	0.15***
	(10.53)	(3.69)	(3.52)	(3.30)	(3.54)

Factor Performance

Table II

Summary Statistics and Alphas for the Bond Pricing Factors

This table presents the summary statistics for the bond pricing factors. The table presents the number of observations, average returns, and Sharpe (1964) ratios for the average return. The table also shows alphas and *t*-statistics for time-series regressions of the bond pricing factors on the mean model and established factor models. The **Bai, Bali, and Wen (2019) model** consists of the MKT, LRF, DRF, and CRF. The sample runs from January 2002 to October 2020, and the factors are calculated as underlying characteristic and return data become available. The Newey and West (1987) *t*-statistics are reported in parentheses. The ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Average returns and alphas

				Alphas			
	N	Mean	*Sh*	Stock	Bond	Combined	Bai et al. (2019)
Term Factor (TERM)	226	0.52***	0.07	0.52***			
		(3.32)		(3.16)			
Default Factor (DEF)	226	–0.02	–0.00	–0.11			
		(–0.15)		(–1.30)			
Bond Market Factor (MKT)	226	0.25***	0.06	0.24***	0.03	0.07*	
		(3.05)		(2.76)	(0.81)	(1.96)	
Downside Risk Factor (DRF)	190	0.45***	0.07	0.44***	0.20**	0.26***	
		(3.16)		(3.65)	(2.59)	(3.57)	
Credit Risk Factor (CRF)	140	0.12	0.03	0.03	0.14	0.10	
		(1.23)		(0.28)	(1.49)	(1.05)	
Liquidity Risk Factor (LRF)	140	0.19**	0.05	0.26**	0.09	0.18	
		(2.01)		(2.43)	(0.84)	(1.60)	
Reversal Factor (REV)	213	0.18**	0.04	0.20**	0.21***	0.20**	0.29***
		(2.06)		(2.12)	(2.60)	(2.26)	(3.22)
Momentum Factor (MOM)	206	–0.04	–0.01	–0.16	–0.09	–0.22**	–0.19*
		(–0.41)		(–1.60)	(–0.92)	(–2.24)	(–1.68)
Volatility Factor (VOL)	190	–0.08	–0.03	–0.10*	–0.04	–0.07	0.02
		(–1.47)		(–1.64)	(–0.77)	(–1.31)	(0.45)
Econ. Uncertainty Factor (UNC)	190	0.00	0.00	0.01	–0.05	–0.04	–0.03
		(0.03)		(0.10)	(–0.82)	(–0.39)	(–0.44)
Long-Term Reversal Factor (LTR)	177	–0.03	–0.01	–0.07	–0.03	–0.06	0.03
		(–0.49)		(–1.06)	(–0.45)	(–0.91)	(0.56)
Monetary Policy Risk Factor (MPF)	109	0.17***	0.11	0.15***	0.15***	0.15***	0.10***
		(3.69)		(3.52)	(3.30)	(3.54)	(2.82)

- **The combined evidence from portfolio-level analyses, Fama and MacBeth (1973) regressions, and spanning tests indicates that the MPF could be an important factor for cross-sectional bond returns in the euro area**

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