



NORTH-HOLLAND

The Quarterly Review of Economics and Finance  
43 (2003) 261–272

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The QUARTERLY REVIEW  
of ECONOMICS  
And FINANCE

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# The response of the default risk premium to macroeconomic shocks

Bradley T. Ewing\*

*Department of Economics, Texas Tech University, P.O. Box 41014, Lubbock, TX 79409-1014, USA*

Received 4 December 2000; received in revised form 8 February 2002; accepted 6 March 2002

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## Abstract

This research is concerned with identifying the response of the default risk premium to shocks to real output growth, inflation, and the stance of monetary policy. The paper employs the newly developed technique of generalized impulse response analysis [Journal of Econometrics 74 (1996) 119; Economics Letters 58 (1998) 17], a method that does not impose a priori restrictions as to the relative importance each of these variables may play in the transmission process. The results show the extent and the magnitude of the relationship between the risk premium and macroeconomic factors.

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*JEL classification:* G120, E440

*Keywords:* Default risk premium; Vector autoregression; Macroeconomic factors

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## 1. Introduction

The default risk premium is an important element in financial models. The spread between lower and higher grade bond returns is often used to capture this risk and is useful in hedging concerns, pricing models, credit risk analysis and management. Several papers have examined the time series properties of the default risk premium, including [Fama and French \(1993\)](#) in the context of market efficiency. [Clinebell, Kahl, and Stevens \(1996\)](#), hereafter CKS, found the default risk premium to follow an autoregressive process. They argue that this autoregressive nature may be due to overreaction in the bond markets. They suggest that future research be directed at determining if the overreaction can be exploited to improve models of the default risk

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\* Tel.: +1-806-742-2201.

*E-mail address:* [bradley.ewing@ttu.edu](mailto:bradley.ewing@ttu.edu) (B.T. Ewing).

premium and experimenting with multivariate time series procedures to build better forecasting models. Recently, [Jarrow and Turnbull \(2000\)](#), in their extensive review of the literature, concluded that “credit spreads are affected by common economic underlying influences.” (p. 282) They argue that macroeconomic factors have explanatory power in predicting the number of defaults, and their model relates the probability of default to the state of the economy. This paper seeks to identify and examine the extent to which innovations in several key macroeconomic variables are transmitted to the default risk premium by comparing both the magnitude and persistence of the responses.

The paper focuses on three fundamental macroeconomic variables thought to affect the default risk premium. The macroeconomic variables are chosen based on previous findings that identified the stance of monetary policy, inflation, and real economic activity, as important state variables in stock and bond returns.

The relationship between the default risk premium and each of these macroeconomic factors is examined by computing generalized impulse response functions derived from the estimation of a four-equation vector autoregression model.<sup>1</sup> These response functions allow us to compare and contrast the effects of unanticipated changes in the macroeconomic factors on the risk premium. An innovation to any of the variables may be interpreted as (unexpected) economic news.<sup>2</sup> Clearly, firms and financial market participants, and thus the default risk premium, may be affected by movements in any of these variables. Knowledge of what leads to movements in the default risk premium and how long shocks may last, might be of concern to financial practitioners and academics.

## **2. Macroeconomic factors and the default risk premium**

[Jarrow and Turnbull \(2000\)](#) show that market risk and default risk are inherently related. Their basic argument is that “If the market value of the firm’s assets unexpectedly changes—generating market risk—this affects the probability of default—generating credit risk. Conversely, if the probability of default unexpectedly changes—generating credit risk—this affects the market value of the firm—generating market risk.” (p. 272) Based on this argument, then an event (i.e., economic news) that affects either the market value of firms or the probability of defaults, should influence the default risk premium. In choosing the macroeconomic factors to include in our analysis, we borrow from the literature that has studied the relationship between stock market returns and macroeconomic factors.<sup>3</sup>

At the aggregate level, the stage of the business cycle—whether the economy is in a growth period or recession—affects probability of default. Both corporate bankruptcy and default rise markedly during a downturn in the business cycle ([Friedman & Kuttner, 1998](#)). If investors believe that a downturn is imminent, they must also believe that default rates will rise and they will demand a higher interest rate on those instruments with the higher probability of default. News about downturns in the economy should correspond to a rise in the default risk premium, provided investors perceptions about downturns are systematically correct on average. Consequently, changes in real output can be expected to affect the default risk premium.

Inflation affects input and output prices and therefore can influence firm performance and profitability. The rate of expected inflation affects the real cost of borrowing and the real return

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