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The aggregate credit spread and the business cycle

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Abstract

An empirical investigation of the credit spread between yields on corporate and treasury bonds shows that it is closely related to macroeconomic fluctuations. The spread behaves counter-cyclically, that is, it narrows during business cycle expansions and widens during contractions. The results also show that the credit spread is a leading indicator of macroeconomic business conditions and turning points in the credit spread can anticipate business cycle turning points. © 2002 Published by Elsevier Science Inc.

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1. Introduction

This paper is an empirical investigation of the longer term dynamics of the credit spread and its relation to aggregate business conditions. The results show that the spread behaves counter-cyclically, i.e., it tends to widen during business cycle recessions and narrow during business cycle expansions.

The dynamic behavior of the spread between the yields on corporate and treasury bonds is an important ingredient in the valuation of credit risky debt securities and credit derivatives. The yield spread has also assumed considerable importance in recent years as a determinant of the profitability of complex investment strategies that depend upon the convergence of yields on securities with differing credit risks. Some of these investment strategies apparently

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came to grief by assuming that the yield spread is mean reverting and tends to converge to an equilibrium value. The empirical results in this paper suggest that since the spread varies counter-cyclically over the longer term, there may not be any such convergence to a steady-state equilibrium value.

Aggregate credit conditions in the economy have long been considered an important *determinant* of the dynamics of the business cycle. Monetary theories of business cycles that trace their roots back to Wicksell and Hawtrey have emphasized instabilities in credit markets, that is, the overexpansion of credit during booms and its rapid contraction during depressions, as one of the principal mechanisms that give rise to cyclical fluctuations. For an exposition of these ideas, see Haberler (1941).

A modern version of this argument has been given by Bernanke and Gertler (1995) and Bernanke, Gertler, and Gilchrist (1996). Our empirical results lend support to this view by showing that turning points of the aggregate credit spread contain significant information about the future turning points of real activity.

2. The economic theory of credit spread dynamics

It is well known that the spread between the yields on defaultable and risk-free bonds is determined by two stochastic variables: the default rate, interpreted as the rate of occurrence of default events, and the fractional recovery rate, i.e., the fraction of the debt recovered by the creditor after a default event has occurred. Here, a default event is defined as any missed or delayed disbursement of interest and/or principal. This is the definition adopted by Moody's Investor's Service, as reported for instance in Truglia (1999), to which we refer for a fuller description. The credit spread is usually expressed as the product of the expected default rate and the complement of the expected recovery rate, both expectations being taken under the risk-neutral measure. This expression can be derived from either the classical "structural" method of valuation of default risky bonds going back to Black and Scholes (1973) and Merton (1974) or the more recent "reduced-form model" used by Duffie and Singleton (1998), Lando (1998), and others.

Macroeconomic fluctuations are an important influence on each of the components that together determine the credit spread: the default rate, the recovery rate, and the risk-neutral measure. It is not hard to see that rate of default would tend to rise during business cycle contractions and fall during expansions. This has been borne out by extensive empirical research and the number of business failures is a well-known business cycle indicator (see Moore, 1961). There is some reason to believe that the recovery rate is higher during expansions than during recessions. Most interestingly, the market price of risk, i.e., the market's appetite for risk and hence its risk-reward tradeoff may also change according to the stage of the cycle, thus, changing the risk-neutral measure. Thus, there is good reason to believe that the corporate-treasury spread varies with the stage of the cycle and is higher during recessions than during expansions.

Empirical investigations going back at least to Moore (1956) have shown that both the aggregate quality of credit and the aggregate level of credit risk vary systematically across

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