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Liquidation triggers and the valuation of equity and debt

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Abstract

Many bankruptcy codes implicitly or explicitly contain net-worth covenants, which provide the firm's bondholders with the right to force reorganization or liquidation if the value of the firm falls below a certain threshold. In practice, however, default does not necessarily lead to immediate change of control or to liquidation of the firm's assets by its debtholders. To consider the impact of this on the valuation of corporate securities, we develop a model in which liquidation is driven by a state variable that accumulates with time and severity of distress. We model a dynamic grace period for the liquidation event. Recent or severe distress events may have greater impact on the liquidation trigger. Our model can be applied to a wide array of bankruptcy codes and jurisdictions.

JEL classification: G12; G32; G33

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1. Introduction

Modeling of default is instrumental in determining the values of corporate securities, since market participants agree to finance a company on terms that reflect the possible

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outcomes, which may include the reorganization or liquidation of the company's assets. A common assumption in current pricing models of corporate securities is that defaults and financial distress lead to immediate liquidation of firm assets (see for example Merton, 1974; Galai and Masulis, 1976). This assumption is supported by the nature of net-worth covenants, which provide the firm's bondholders with the right to force reorganization or liquidation if the firm's value falls below a certain threshold. In practice, however, default does not necessarily lead to immediate change of control or to liquidation of the firm's assets by its debtholders. This fact is confirmed by numerous empirical studies showing that in the US, the average interval between the indication of financial distress and its resolution ranges from one to three years.

The finance literature contains different explanations for this gap between default and liquidation or reorganization. Hotchkiss (1995) explains it as resulting from inefficient design of bankruptcy laws, which favor firm continuation even at the expense of some violations of the lenders' contractual rights. On the other hand, Kahl (2002) claims the bankruptcy process to be efficient, since creditors and court accumulate information and learn about a firm's viability by observing its performance over time. Be it as it may, it is well documented by empirical research that firms who improve their operating performance when still in financial distress usually survive, while those who keep presenting poor operating performance eventually lose their independence in a liquidation process or in acquisition (e.g., Wruck, 1990; White, 1996; Kahl, 2001 and Morrison, forthcoming).

Empirical studies have shown that the criteria for liquidation of a firm after the onset of financial distress vary substantially across countries, bankruptcy procedures and over time. Thorburn (2000) compares the Swedish to the USA bankruptcy procedures. She finds the Swedish legal system to be much faster (the average time in bankruptcy is 2.5 months compared with more than a year under Chapter 11 of the US bankruptcy code). Moreover, the type of procedure may influence the time in bankruptcy. Bris et al. (2006) show that for more than 300 cases for the Arizona and the New York federal bankruptcy courts from 1996 to 2001, firms spent on average 119 more days under Chapter 11 (reorganization) compared to Chapter 7 (liquidation). Covitz et al. (2006) show that there has been a significant decline in the length of time spent in default for US public companies, from approximately 36 months in late 1980s to 12 months between 1993 and 2002. Similar evidence of shortening the time in bankruptcy appears also in Bris et al. (2006) who show that the average Chapter 7 and Chapter 11 bankruptcy took about two years to resolve, which is shorter than the 3.67 years that Franks and Torous (1989) report.

Most models of credit risk and models for pricing corporate debt and equity are based on a fixed maturity of debt, where usually liquidation or reorganization occurs when a certain bankruptcy trigger is met. Empirical evidence shows that the time between meeting the trigger and actual liquidation is significant (see Franks and Torous, 1989; Betker, 1995; Gilson, 1997 and Helwege, 1999). This time can have a substantial impact on the value of corporate securities and credit spreads. To capture the effects of the difference between default and liquidation or reorganization on the valuation of corporate securities, we present a general and adjustable valuation model in which liquidation is triggered according to the accumulated distress period of the firm. More precisely, we build on the framework of the structural modeling of debt (Merton, 1974; Black and Cox, 1976), which allows us to determine the values of equity and debt given the overall firm value.