

**The Impact of
“Corporate Debt Value, Bond Covenants,
and Optimal Capital Structure”**

**by
Hayne Leland**

The first Stephen A. Ross Prize in Financial Economics has been awarded to “Corporate Debt Value, Bond Covenants, and Optimal Capital Structure,” written by Hayne Leland of the Haas School of Business. The prize committee chose this paper in part because of the substantial influence it has had on subsequent research on capital structure and debt valuation. We give below a brief overview of this paper’s place in the literature. Our goal is not to provide a complete survey of all research in this area, but rather to identify the major strands in the development of capital structure research that are related to the modeling and insights found in the Leland paper.

As Hayne Leland clearly states in his paper, his analysis builds on the work of Merton (1974) and Black and Cox (1976) and addresses issues also examined by Brennan and Schwartz (1978). Leland’s significant contribution to capital structure research lies in the fact that he was able to develop an analytical model with closed-form solutions that was rich enough to incorporate both the tax benefits and deadweight bankruptcy costs associated with debt issuance. All of this was done in a dynamic setting that allowed for default to be determined endogenously as the result of an optimal decision policy carried out by equity holders.

The original “Leland model” presented in the 1994 paper is based on the assumption that the firm has a fixed debt obligation (a consol bond) that is not adjusted in any way when firm value changes. The fixed obligation remains in force until the firm defaults. In other words, in the original model the decision of how much debt to issue is a static choice. A number of subsequent papers have analyzed models in which equity holders can adjust outstanding debt levels, making the capital structure decision a dynamic one. Included in this group of papers are Goldstein, Ju, and Leland (2001), Hackbarth, Miao, and Morellec (2006), Strebulaev (2007), and Bhamra, Kuehn, and Strebulaev (2008). These models with dynamic capital structure adjustment generally predict lower leverage ratios than the static model, ratios which are more consistent with empirical regularities.

Structural models of the sort developed by Leland also allow one to examine debt pricing and credit risk issues. Several papers have explored how optimal capital structure models that are variations on the Leland (1994) model can address credit risk pricing. For example, Leland and Toft (1996) studies the term structure of credit spreads, while

Morellec (2001) examines how capital structure and debt pricing is affected by the liquidity of corporate assets.

The Leland model involves a single outstanding debt issue. More complex capital structures have been studied in a number of papers. Recent examples are Hackbarth, Hennessy, and Leland (2006), which look at differences between bank and public debt, and Ju, Parrino, Poteshman, and Weisbach (2004), which looks at finite maturity debt.

The Leland (1994) model is based on the assumption that the riskiness of the firm's assets is fixed and cannot be affected by equity holders. It is well known that given their limited liability, equity holders may have an incentive to increase the risk of the firm's assets (the asset substitution problem). Extensions of the Leland model to include agency costs related to asset substitution have been carried out, most notably by Hayne Leland himself in Leland (1998).

The firm in Leland (1994) follows a fixed investment policy. A number of studies have recently analyzed optimal investment and finance decisions. Recent examples include Sundaresan and Wang (2008) and Lobanov and Strebulaev (2008).

It is implicitly assumed in Leland (1994) that the firm's managers have interests that are completely aligned with equity holders and they make default decisions that maximize the equity holders' value. Various studies have looked at how conflict of interests between shareholders and managers may affect capital structure decisions. Examples include Morellec (2004) and Subramanian (2008).

References

Bhamra, Harjoat Singh, Lars-Alexander Kuehn and Ilya A. Strebulaev, "The Aggregate Dynamics of Capital Structure and Macroeconomic Risk," Working Paper, Stanford University, (2008).

Black, Fischer and John C. Cox, "Valuing Corporate Securities: Some Effects of Bond Indenture Provisions," *The Journal of Finance*, Vol. 31, No. 2, (May, 1976), pp. 351-367.

Brennan, Michael J and Eduardo Schwartz, "Corporate Income Taxes, Valuation and the Problem of Optimal Capital Structure," *Journal of Business*, Vol. 51, No. 1, (January 1978), pp. 103-114.

Goldstein, Robert, Nengjiu Ju, and Hayne Leland, "An EBIT-Based Model of Dynamic Capital Structure," *The Journal of Business*, Vol. 74, No. 4 (Oct., 2001), pp. 483-512.

Hackbarth, Dirk, Christopher A. Hennessy, and Hayne E. Leland, "Can the Trade-off Theory Explain Debt Structure?" *Review of Financial Studies*, Vol. 20, (Sep., 2007), pp. 1389 - 1428.

Hackbarth, Dirk, Jianjun Miao, and Erwan Morellec, "Capital Structure, Credit Risk, and Macroeconomic Conditions." *Journal of Financial Economics*, Vol. 82, (2006), pp. 519-550.

Ju, Nengjiu, Robert Parrino, Allen M. Poteshman, and Michael S. Weisbach, "Horses and Rabbits? Optimal Dynamic Capital Structure from Shareholder and Manager Perspectives," *Journal of Financial and Quantitative Analysis*, Vol. 40, (2005). Pp. 259-281.

Leland, Hayne E., "Corporate Debt Value, Bond Covenants, and Optimal Capital Structure," *The Journal of Finance*, Vol. 49, No. 4, (Sep., 1994), pp. 1213-1252.

_____, "Agency Costs, Risk Management and Capital Structure," *The Journal of Finance*, Vol. 53, No. 4, (Aug., 1998), pp. 1213-1243.

Leland, Hayne E. and Klaus Bjerre Toft, "Optimal Capital Structure, Endogenous Bankruptcy, and the Term Structure of Credit Spreads," *The Journal of Finance*, Vol. 51, No. 3, (Jul., 1996), pp. 987-1019.

Lobanov, Sergey N. and Ilya A. Strebulaev, "Theory of Dynamic Corporate Financing and Dynamic Investment," Working Paper, Stanford University, (2008).

Merton, Robert C., "On the Pricing of Corporate Debt: The Risk Structure of Interest Rates," *The Journal of Finance*, Vol. 29, No. 2, (May, 1974), pp. 449-470.

Morellec, Erwan, "Asset Liquidity, Capital Structure, and Secured Debt" *Journal of Financial Economics*, Vol. 61, No. 2, (August, 2001), pp. 173-206.

_____, "Can Managerial Discretion Explain Observed Leverage Ratios?" *The Review of Financial Studies*, Vol. 17, No. 1, (Spring, 2004), pp. 257-294.

Strebulaev, Ilya A., "Do Tests of Capital Structure Theory Mean What They Say?" *Journal of Finance*, Vol. 62, No. 4, (August, 2007), 1747-1787

Subramanian, Ajay, "Managerial Flexibility, Agency Costs and Optimal Capital Structure," Working Paper, Georgia State University, (2008).

Sundaresan, Suresh and Neng Wang, "Dynamic Investment, Capital Structure, and Debt Overhang," Working Paper, Columbia University, (2006).