Penetrating the Tax Shields

Are some commonly used methodologies for calculating the value of tax shields inconsistent? Yes, as IESE's Pablo Fernandez explains.



May 7, 2004

Taxes are not merely the concern of financial managers, but are an important factor influencing most financial decisions. Tax shields, for example, alter capital budgeting decisions and have an effect on capital structure, etc. A tax shield is the reduction in income

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taxes that results from taking an allowable deduction from taxable income. Often, because interest on debt is a tax-deductible expense, companies take on debt, which acts as a tax shield.

But however important the issue, there is no consensus in the existing literature regarding the correct way to compute the value of tax shields. Most authors think of calculating the value of the tax shield in terms of the appropriate present value of the tax savings due to interest payments on debt. Others propose that the tax savings be discounted either from the cost of debt or from the cost of capital for the unlevered firm.

Formula for calculating the value of the tax shields

In his working paper "The Value of Tax Shields and the Risk of the Net Increase of Debt," IESE Business School Financial Management Professor Pablo Fernández shows that a consistent way to estimate the value of the tax savings is by thinking of them not as the present value of a set of cash flows, but as the difference between the present values of two different sets of cash flows: flows to the unlevered firm and flows to the levered firm.

Fernández uses a new method to demonstrate that, in a world with no leverage cost, the value of tax shields is the tax rate times the debt, plus the tax rate times the present value of the net increases of debt. This expression is the difference between the present values of two different cash flows, each with its own risk: the present value of taxes for the unlevered company and the present value of taxes for the levered company.

The paper applies this general formula to specific situations (perpetual debt, debt of one-year maturity but perpetually rolled-over, debt proportional to the equity value, etc.) and derives the relation between the required return on assets and the required return on equity for perpetuities in a world without leverage cost. The corresponding relation between the beta of the levered equity, the beta of the unlevered equity, and the beta of debt is also derived.

The author shows that for perpetual debt, the value of tax shields is equal to the tax rate times the value of debt.

When the company is expected to repay the current debt without issuing new debt, the value of tax shields is the present value of the interest times the tax rate, discounted at the required return to debt.

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For constant growth companies, and under certain assumptions, the value of tax shields in a world with no leverage costs is the present value of the debt times the tax rate times the required return to the unlevered equity, discounted at the unlevered cost of equity.

Other methods for calculating the value of the tax shield

An important part of the paper is dedicated to revising and analyzing the existing financial literature on the values of tax shields. Fernandez finds that most of the previous papers calculate the value of tax shields as the present value of tax savings due to the payment of interest.

But, he argues, the correct measure of the value of tax shields is the difference between two present values, of taxes for the unlevered company and of taxes for the levered company. The author shows that methodologies discounting the expected tax shields at the required return to unlevered equity yield inconsistent results regarding the present value of the net increases of debt.

Given the large number of alternative methods existing in the literature to calculate the value of tax shields, Fernández also proposes three ways to compare and differentiate between them: to calculate the value of tax shields for perpetuities for each different approach; to check the implied present value of the net increases of debt with each; and to check the implied relation between the unlevered and the levered cost of equity with each of the different approaches proposed in the literature.

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