

INTRODUCTORY FINANCE TEXTBOOK ILLUSTRATION OF CAPITAL STRUCTURE THEORIES

Kavous Ardalan, Marist College
Kavous.Ardalan@Marist.Edu

ABSTRACT

The purpose of this paper is to make recommendations for improving the theoretical exposition and graphical representation of the capital structure theories made by introductory finance textbooks. It bases its arguments on the textbooks discussion of the capital structure theories which constitute a progression from the Modigliani and Miller (M&M) theory with no taxes to M&M with taxes, effects of bankruptcy costs, agency theory, and finally the trade-off theory. It notes that such a progression is made on an additive basis. It also notes that some textbooks diagrammatical representations of the capital structure theories are inconsistent with the original theories which they tend to represent. Moreover, most textbooks diagrammatical representations of the capital structure theories are misleading.

1. INTRODUCTION

Over the years, introductory finance textbooks have improved their exposition of a variety of topics and currently are in good standing. The purpose of this paper is to make recommendations for improving the theoretical exposition and graphical representation of the capital structure theories made by introductory finance textbooks.

Current introductory finance textbooks discuss and diagrammatically illustrate capital structure theories as a progression from the Modigliani and Miller (M&M) theory with no taxes to M&M with taxes, effects of bankruptcy costs, agency theory, and finally the trade-off theory. They accomplish this task under the assumption that this progression can be made on an additive basis. That is, although a given theory operates in its own specific environment, it can be combined with the previous theory which operates in a different environment. Moreover, some textbooks diagrammatical representations of the capital structure theories, by choosing the value of the share rather than the value of the firm as the goal of the firm and its representation on the vertical axis of their diagram, become inconsistent with the original theories which they tend to represent. Furthermore, most textbooks diagrammatical representations of the capital structure theories are misleading since they do not explicitly show on the diagram the starting point of the above-mentioned theoretical progression, that is, the M&M with no taxes.

This study examines thirty-two current introductory finance textbooks published by major finance textbook publishers, i.e., those who were present at the latest annual Financial Management Association meeting. The textbooks are: Besley-Brigham (1999), Block-Hirt (2000), Brealey-Myers (2000), Brealey-Myers-Marcus (1999), Brigham-Gapenski (1996), Brigham-Gapenski-Ehrhardt (1999), Brigham-Houston (1998), Chambers-Lacey (1999), Damodaran (1997), Dickerson-Campsey-Brigham (1995), Eakins (1999), Emery (1998), Emery-Finnerty (1997), Emery-Finnerty-Stowe (1998), Gallagher-Andrew (2000), Gitman (1995), Gitman (1997), Hickman-Hunter-Byrd (1996), Kaen (1995), Keown-Petty-Scott-Martin (1999), Kolb-Rodriguez (1996), Lee-Finnerty-Norton (1997), Levy (1998), Moyer-McGuigan-Kretlow (1998), Pinches (1996), Pinches (1994), Ross-Westerfield-Jaffe (1999), Ross-Westerfield-Jordan (1999), Scott-Martin-Petty-Keown (1996), Van Horne (1998), Van Horne-Wachowicz (1998), and Weston-Besley-Brigham (1996).

Section 2 discusses the textbook choice of share value maximization versus firm value maximization as the goal of the firm and its representation on the vertical axis of their diagram. Section 3 explains the problem of the additivity embodied in the textbook discussion of the capital structure theories as a progression.

2. SHARE VALUE MAXIMIZATION VERSUS FIRM VALUE MAXIMIZATION

Current introductory finance textbooks discuss different theories of capital structure. These constitute a progression from the Modigliani and Miller (M&M) theory with no taxes to M&M with taxes, effects of bankruptcy costs, agency theory, and finally the trade-off theory. All these theories are discussed, and shown on a diagram, with the value of the firm as the centerpiece such that the optimal capital structure is defined as that mix of financing which maximizes the firm value. In this way, practically, the goal of the firm is defined as firm value maximization, even though some textbooks start their capital structure chapters with share value maximization as the theoretical definition of the goal of the firm.

More specifically, eight of the thirty-two textbooks start the chapter with share value maximization as the definition of the goal of the firm, but discuss relevant theories with firm value maximization as the central point. The textbooks are: Besley-Brigham (1999), Brigham-Gapenski-Ehrhardt (1999), Brigham-Houston (1998), Dickerson-Campsey-Brigham (1995), Eakins (1999), Emery (1998), Hickman-Hunter-Byrd (1996), and Kaen (1995).

The remaining twenty-four textbooks start the chapter with firm value maximization as the definition of the goal of the firm and discuss capital structure theories with the same goal at the forefront. The textbooks are: Block-Hirt (2000), Brealey-Myers (2000), Brealey-Myers-Marcus (1999), Brigham-Gapenski (1996), Chambers-Lacey (1999), Damodaran (1997), Emery-Finnerty (1997), Emery-Finnerty-Stowe (1998), Gallagher-Andrew (2000), Gitman (1995), Gitman (1997), Keown-Petty-Scott-Martin (1999), Kolb-Rodriguez (1996), Lee-Finnerty-Norton (1997), Levy (1998), Moyer-McGuigan-Kretlow (1998), Pinches (1996), Pinches (1994), Ross-Westerfield-Jaffe (1999), Ross-Westerfield-Jordan (1999), Scott-Martin-Petty-Keown (1996), Van Horne (1998), Van Horne-Wachowicz (1998), and Weston-Besley-Brigham (1996).

As noted above, current introductory finance textbooks discuss different theories of capital structure in a progression which culminates in the trade-off theory. Such theories are also shown on a diagram where the capital structure is measured on the horizontal axis and the firm value, or the share value, on the vertical axis, as in Exhibit 1.

Most textbooks measure the firm value on the vertical axis. Only five of the thirty-two textbooks measure the share value on the vertical axis. The textbooks are: Besley-Brigham (1999), Brigham-Gapenski-Ehrhardt (1999), Brigham-Houston (1998), Dickerson-Campsey-Brigham (1995), and Weston-Besley-Brigham (1996). This practice is in accordance with the initial theoretical definition of the goal of the firm in their capital structure chapters. However, this definition is not in accordance with the original theories which they intend to represent since the original theories are stated in terms of firm value rather than share value.

3. THE PROBLEM OF ADDITIVITY

As was noted above, current introductory finance textbooks discuss different theories of capital structure in a progression from the M&M with no taxes to M&M with taxes, effects of bankruptcy costs, agency theory, and finally the trade-off theory. This progression is also shown on a diagram, such as Exhibit 1.

An important aspect of the discussion of the capital structure theories in introductory finance textbooks is the way it treats the value of the firm. More specifically, the value of the firm is treated as the algebraic sum of its constituent components without any consideration for the interaction among these components. For instance, in a typical diagrammatical representation of the capital

structure theories, such as Exhibit 1, all the curves emanate from *the same point* on the vertical axis and, to the right of the vertical axis, they deviate from each other in an *additive* manner to reflect the expected costs of financial distress and the agency cost, as in Exhibit 1.

However, when the firm is moved from *a world* in which there are no financial distress costs to *a different world* in which they exist, all valuations need to be done anew. Under the new and different circumstances, both equity and debt need to be valued again. Their values would generally be different under the new circumstance than the old one. Therefore, the sum of the values of equity and debt, which is the equal to the value of the firm, would be different. Therefore, the new curve, which also reflects the costs of financial distress, need not necessarily emanate from *the same point* on the vertical axis as the curve reflecting no financial distress costs. To emphasize, this is because the valuations, and, therefore, the values of stocks and bonds, in *the two different worlds* would be different.

The same idea applies to the situation when the firm is moved from *a world* with no shareholder-bondholder agency relationship to *a different world* in which such agency relations exist. That is, under the new and different circumstances not only would the valuations, and, therefore, the values of stocks and bonds, be different from what they were in the previous one, but also the valuation and, therefore, the value of the expected financial distress costs, be different from what it was in the *previous world*. Therefore, in general, the curves shown on a typical capital structure theory diagram, as in Exhibit 6, need not necessarily emanate from *the same point* on the vertical axis. Moreover, deviations of the curves, to the right of the vertical axis, are not *additive*. This is because, in *different worlds*, there will be different interactions among variables. In other words, the curve representing the valuation *in each world* should be genuinely derived anew based on the circumstances prevailing *in that specific world*.

The *additive* nature of the curves shown in Exhibit 1 reveals that it brings the base, which was derived under the previous world circumstances, to the next world without considering that it changes as the circumstances are changed. Given this base, which is transferred directly from the previous world, then some of the implications of the circumstances prevailing in the next world are *added* to it. A better treatment notes that when the firm is moved from the previous world to the next world, the basis of the analysis, which is being transferred from the previous world to the next world, should also be re-analyzed and re-configured under the new circumstances along with the other implications of the circumstances prevailing in the next and new circumstances.

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