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Human capital, capital structure, and employee pay: An empirical analysis ☆

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ABSTRACT

We test the predictions of Titman (1984) and Berk, Stanton, and Zechner (2010) by examining the effect of leverage on labor costs. Leverage has a significantly positive impact on cash, equity-based, and total compensation of chief executive officers (CEOs). Compensation of new CEOs hired from outside the firm is positively related to prior-year firm leverage. In addition, leverage has a positive and significant impact on average employee pay. The incremental total labor expenses associated with an increase in leverage are large enough to offset the incremental tax benefits of debt. The empirical evidence supports the theoretical prediction that labor costs limit the use of debt.

1. Introduction

The trade-off theory of capital structure points to bankruptcy costs as the main reason that firms in many industries do not assume higher levels of leverage to take advantage of the corporate tax saving benefits of debt. However, considerable empirical evidence indicates that the magnitude of direct bankruptcy costs is too low to be a sufficient disincentive preventing firms from taking on higher levels of debt. Some authors have, therefore, suggested indirect bankruptcy costs as a solution to the puzzle of the observed underleveraging of firms in many industries. In an important paper, Titman (1984) develops a model in which a firm's liquidation decision is causally linked to its bankruptcy status. He argues that customers, workers, and suppliers of firms that produce unique or specialized products are likely to suffer high costs in the event of liquidation. In particular, in a setting where employees have firm-specific human capital, the fact that bankruptcy can impose significant costs on employees (by reducing the value of their human capital) can significantly affect firms' capital structures.[1] Formalizing the Titman (1984) arguments, Berk, Stanton, and Zechner (2010; BSZ (2010) hereafter) develop a model incorporating the idea

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[1] For an excellent review of empirical research on capital structure, see Parsons and Titman (2008).

that human capital costs associated with financial distress and bankruptcy could be large enough to be a disincentive for firms to issue debt.

The objective of this paper is to empirically analyze, for the first time in the literature, whether human capital costs are an important determinant of the capital structure of firms as postulated by the theoretical literature. We do this by examining the relation between the observed capital structures of firms and the compensation of their chief executive officers (CEOs), as well as the relation between observed capital structures and the average wages of their work forces. While we use CEO compensation to measure the pay of a critical employee, we use the average employee wage to measure the compensation of a collective employee. In the model of BSZ (2010), each firm faces a risk-averse employee and risk-neutral investors. In the optimal labor contract between firms and employees, a firm with higher leverage pays a higher wage to its employee to compensate him for the expected bankruptcy costs that will be borne by the employee, because the employee is unable to fully insure his human capital risk. Firms, therefore, choose not to increase leverage beyond the point where the marginal tax benefits of debt are offset by the incremental labor costs associated with higher levels of debt. The empirical implication here is that, in the cross section, firms with higher leverage are associated with higher employee pay.[2] We test this prediction ("the Titman-BSZ prediction") in our empirical analysis. We also study whether the magnitude of the additional compensation associated with an increase in leverage is large enough to at least partially explain the underleveraging of firms.

In contrast to the theories that focus on the ex ante relation between leverage and employee pay, Perotti and Spier (1993) focus on the ex post effect of leverage on employee pay.[3] In particular, they argue that firms are able to use leverage strategically when current profits are low and future investment is necessary to guarantee full payment of the union's claim (wages). By retiring equity through a junior debt issue, shareholders can credibly threaten not to undertake valuable new investments unless the union agrees to wage reductions. The implication of the argument is that, under suitable conditions, firms with high leverage are associated with lower employee pay.

The ex post relation between leverage and employee pay implied by the model of Perotti and Spier (1993), however, is not inconsistent with the ex ante relation between the same variables in the Titman-BSZ prediction. As Perotti and Spier (1993) point out, if workers anticipate that equity holders could attempt to use higher leverage to negotiate their wages downward ex post, they will demand higher expected wages ex ante to compensate them for bearing this risk. Perotti and Spier (1993) also point out that a firm will not be able to use leverage as a bargaining tool to reduce employee wages if their profits from existing assets are large (i.e., the firm does not face a significant probability of financial distress). We make use of these results to empirically disentangle the ex ante effects suggested by the Titman-BSZ prediction from the ex post effects suggested by Perotti and Spier (1993). We accomplish this by splitting our sample between firms approaching financial distress (distressed firms) and those that do not face a significant probability of distress (safe firms).

We find that the debt ratio of a firm positively affects the magnitude of its CEO compensation. Firms with higher leverage pay their CEOs more, in terms of total compensation, cash pay, and equity-based pay. In our ordinary least squares (OLS) regressions, an increase in market leverage by one standard deviation is associated with an increase of more than 8% in CEO total compensation, a magnitude that is economically significant. We recognize that unobserved CEO characteristics could influence firm leverage as well as CEO pay, so that the direction of causality can be ambiguous. For example, CEOs who have had more interaction with the board (and, therefore, have more influence) could have greater ability to affect their own pay and at the same time choose the firm's leverage level. To address this issue, we study the relation between the first-year compensation of newly appointed CEOs who are hired from outside and firm leverage in the year prior to their appointment. Clearly, newly appointed CEOs who are hired from outside should have no influence on the firm's leverage in the year prior to their appointment. We show that, even in the case of new CEOs hired from the outside, compensation is positively related to leverage.

We also find that leverage has a positive and significant impact on average employee pay. Further, the incremental labor expenses associated with an increase in leverage are large enough to offset all of the incremental tax benefits arising from such an increase. For a firm with median values of leverage, average employee pay, total labor expenses, and total debt, if the market leverage ratio increases by one standard deviation, total labor expenses increase by $14.01 million, holding the number of employees constant. Assuming 6% as the average return on debt in our sample from 1992 to 2006 and assuming a tax rate of 35%, the tax benefits of debt increase by $5.09 million, smaller than the increase in total labor expenses of $14.01 million. This supports the hypothesis that the incremental labor costs associated with an increase in leverage are economically significant and large enough in magnitude to limit the use of debt.

One potential concern with our baseline analysis is the endogeneity of leverage. In particular, the assets of a given firm could be such that they can support a high level of leverage (for example, the proportion of tangible assets could be high) and could also require highly paid employees to operate these assets, thus generating a positive correlation between leverage and employee pay. To deal with this potential endogeneity problem, we employ an instrumental variable, namely, the marginal corporate tax rate, to generate an exogenous variation in leverage. The theoretical literature in corporate finance suggests

[2] The models of Jaggia and Thakor (1994) and Berkovitch, Israel, and Spiegel (2000) also have somewhat similar predictions.

[3] Several other papers make similar arguments. See, e.g., Baldwin (1983), Bronars and Deere (1991), Perotti and Spier (1993), Dasgupta and Sengupta (1993), Hennessy and Livdan (2009), and Brown, Fee, and Thomas (2009).