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journal homepage: [www.elsevier.com/locate/jae](http://www.elsevier.com/locate/jae)Effect of personal taxes on managers' decisions to sell their stock<sup>☆</sup>Li Jin<sup>a</sup>, S.P. Kothari<sup>b,\*</sup><sup>a</sup> Harvard Business School, USA<sup>b</sup> MIT Sloan School of Management, USA

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## ABSTRACT

We examine the effect of personal taxes on CEOs' decisions to sell their equity, controlling for diversification, managerial overconfidence, and other determinants. While CEOs frequently sell large amounts of their unrestricted firm equity, the tax burden associated with the sale significantly deters them from selling equity even after controlling for other determinants like diversification. We also find that both taxable institutional investors and CEOs respond to taxes in their selling of equity, although CEOs appear to be less tax-sensitive. Our findings underscore the importance of taxes in corporate and managerial decisions and they have implications for executive compensation policies.

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## 1. Introduction

In the United States, CEOs' ownership of company stock and options is a principal means of aligning their incentives with shareholders (Jensen and Murphy, 1990; Hall and Liebman, 1998; Core et al., 2003). CEOs' holdings change through time with new grants, exercise of vested options, and sale of vested stock. We study the determinants of the decision of large, publicly traded US corporations' CEOs to sell their vested equity. We find that CEOs frequently sell substantial amounts of stock in their own firms, the value of which often exceeds that of new equity grants. We pay particular attention to personal tax considerations and diversification motives for such sales. The compensation literature makes frequent reference to diversification as an important consideration in CEOs' decisions to sell or retain firm equity (Aggarwal and Samwick, 1999; Jin, 2002; Garvey and Milbourn, 2003, among others). In contrast, tax as a determinant of CEOs' selling behavior is less understood. Our results show that, controlling for other determinants of their selling, CEOs are less likely to sell their vested equity as the tax burden increases. We also find that CEOs react less to tax incentives than taxable institutional investors, although both do react to taxes. Somewhat surprisingly, the diversification benefit of selling does

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not appear to overcome the disincentive to sell and incur an immediate tax liability. Other determinants affect CEOs' selling decisions largely as predicted in the literature.

Understanding CEOs' equity-selling patterns is important for several reasons. First, how CEOs undo incentives from equity compensation informs the design of equity compensation contracts in more effectively aligning incentives. Second, it indirectly provides evidence on how corporations (managers) react to tax incentives. Existing literature suggests corporations rationally respond to tax incentives (see, for example, Auerbach, 2002; Gordon and Hines, 2002; Graham and John, 2003), and that firms trade off taxes and other considerations such as financial accounting costs and contracting costs (see, for example, Shackelford et al., 2001; Erickson et al., 2004). To better understand how corporations respond to incentives, it is helpful to know whether corporate decision makers respond to tax incentives and trade off taxes and other considerations in their personal portfolio decisions. Third, the existing literature on individual investors documents behavioral biases such as the "disposition effect" (see Odean, 1998), whereby investors sell winning investments too soon and thus forego tax deferral, but hold on to losing investments too long. CEOs as a group of individuals are well-advised and sophisticated. They also have large stakes affected by taxes, and therefore might care about tax optimization more than the average investor. Our study examines whether CEOs are tax savvy.

In Section 2, we review the literature on the determinants of equity selling by CEOs. We describe our empirical methodology, and the data and measurement of all variables used in the empirical analysis, in Section 3. Section 4 provides descriptive evidence of CEOs' selling behavior as well as evidence of the determinants of the selling of their equity. Section 5 concludes.

## 2. Related literature

Previous research, discussed below, identifies and empirically explores several determinants of CEOs' sale of equity. These include taxes, diversification, managerial behavioral biases, implicit and explicit contracts between shareholders and managers, CEOs' liquidity needs, managerial opportunism (i.e., trading on insider information), and managerial ability to hedge their positions.

### 2.1. Taxes

A substantial body of theoretical and empirical literature examines the effect of taxes on investors' equity portfolio decisions, and also on security prices. This literature explores the equilibrium asset-pricing effects of taxes, and the effect of taxes on investors' decisions to sell (or not sell) securities with capital gains or losses. The summary of this research below shows that this literature is primarily concerned with the effect only of taxes, not the effect of multiple factors affecting investors' decision to sell equity.

Assuming no short-sale constraints, Constantinides (1983, 1984) predicts that investors will buy and sell securities, i.e., rebalance portfolios, without triggering any capital gains tax until death. With short-sale constraints, however, it is not possible to defer taxes indefinitely (i.e., until death). In the context of CEOs, a short-sale constraint is likely binding because corporations typically disallow a CEO from selling short the firm's equity. Absent short-selling, Klein (1999) expects security prices to adjust such that investors' after-tax rates of risk-adjusted returns are equal. Viard (2000) extends Klein's analysis by deriving the conditions for equilibrium asset prices and showing that prices of appreciated securities include a component that offsets the seller's disincentive to sell the appreciated security and incur capital gains tax. This is consistent with the lock-in effect of capital gains taxes that discourages selling. Dammon et al. (2001a) study the effect of capital gains tax on investors' optimal portfolio decisions in the presence of short-sale constraints. Not surprisingly, they show that an investor would increase the weight of an appreciated security in the portfolio because of taxes, especially as the investor ages, because capital gains tax can be effectively eliminated upon death. In related work, Shackelford and Verrecchia (2002) show that the differential between the long-term and short-term capital gains tax rates creates a trade-off between optimal risk-sharing and optimal tax-related trading strategy. They show that sellers are reluctant to sell appreciated assets sooner because they are subject to higher capital gains taxes. Thus, the overall theme of the literature is that taxes discourage selling of appreciated stocks in the presence of short-sale constraints.

An equally voluminous empirical literature complements the theoretical work examining the effect of taxes on investors' portfolio decisions and on asset prices. For example, many document the lock-in effect of capital gains tax.<sup>1</sup> But taxes have received little empirical attention as a factor governing the timing of CEOs' selling of equity in a multivariate setting that allows a variety of determinants of CEOs' selling decisions in the empirical analysis.

### 2.2. Diversification

Lambert et al. (1991), Hall and Murphy (2000, 2002), and Meulbroek (2001) explain that a CEO with an under-diversified portfolio that is over-weighted in the firm's equity has an incentive to sell equity. Shareholders also bear some of

<sup>1</sup> See Feldstein et al. (1980), Landsman and Shackelford (1995), Reese (1998), Goolsbee and Austan (2000a, b), Poterba and Weisbenner (2001), Klein (2001), Blouin et al. (2003), Ayers et al. (2003), Jin (2006), Ellis et al. (2006), and Dai et al. (2006).

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