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Bankruptcy risk induced by career concerns of regulators ☆

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A B S T R A C T

We introduce a model in which a regulator employs mechanism design to embed her human capital beta signal(s) in a firm's capital structure. This can enhance her compensation at the firm, and the value of her contract with the firm in the form of an executive stock option. We prove that the agency cost of this revolving door behavior increases the firm's financial leverage, bankruptcy risk, and affects estimation of firm value at risk (VaR).

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1. Introduction

This paper extends the contingent claims career options literature introduced by Bodie et al. (2008) to firm bankruptcy risk induced by a regulator in a revolving door setting.[2] The intuition behind our model is that regulators encounter alternative employment opportunities available at firms they regulate and so can make lucrative changes. They bring value to the firm either by reducing shareholders' financing costs, or by allocating to shareholders regulatory benefits normally expected as consumer surplus in regulatory pricing decisions.[3] In either case, the regulator's employment option value depends on the regulated firm's market value which reflects its levered beta coefficient. Thus relative to its beta value in the case of a disinterested regulator, we argue there will be a beneficial impact on the firm's beta and its value when a regulator has chosen to exercise her career option to join the firm.[4] Whereas Treussard (2007) and Bodie et al. (2008) solve the problem of *when* to switch careers, our model's focus is on *what firm valuation and risk changes* occur once a regulator decides to switch career and take a position with a firm she hitherto regulated. These changes arise because she embeds her human capital beta in the firm's capital structure to her benefit as she makes the career change.[5] As a part of the decision process to switch career choices she negotiates an indexed option contract that includes firm value considerations.[6]

Spiegel and Spulber (1994) show how regulators' welfare functions are tied to a firm's capital structure through debt. More recently Bortolotti et al. (2011) report that highly levered firms receive more favorable regulation. In our model, with decomposition of the firm's levered beta to show a labor element, we examine how the regulator utilizes her human capital beta as a signaling device. High human capital betas may characterize regulators indifferent to the firm, but low betas signal a sympathetic regulator willing to advance the firm's lobbying stances (DeHaan et al., 2012). We show how that beta parameter can therefore be used to influence the barrier in an indexed executive stock option contract in order to increase the value of an early exercise of the regulator's career-change option premium (Goldman and Slezak, 2006). In that context, the volatility of firm value increases. See e.g., Johnson and Tian (2000a); Jørgensen (2002). Thus, we employ a signal dependent option pricing model by Guo (2001) and Shepp (2002) to identify firm bankruptcy risk in bad states by comparing firm vega,[7] and firm value at risk (VaR), with and without regulator signals embedded in capital structure. In a broad sense, our model falls under the rubric of the Jensen and Meckling (1976) agency theory of capital structure, as opposed to the Modigliani and Miller (1958) capital structure irrelevancy model.

[2] See e.g., Holmström (1999); Che (1995) and Salant (1995).
[3] Houston et al. (2014); Litzenberger and Sosin (1979).
[4] See e.g., Acemoglu et al. (2013).
[5] This is a pricing result in Jagannathan and Wang (1996, Eq. (22)) where return on a human capital factor is used to augment a conditional CAPM model. In Bodie and Treussard (2007, p. 43) human capital beta refers to a lifetime portfolio allocation fraction that does not change. In our model it can measure the capacity of the erstwhile regulator to influence outcomes from the regulatory process to favor the firm.
[6] Dittmann et al. (2013) highlight disincentive effects of indexed contracts.
[7] See e.g., Hull (2006, pp. 359–360).