The Optimal Capital Structure of a Liquidity-insuring Bank

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ABSTRACT

This paper deals with the question of the optimal capital structure for a banking firm. It considers a competitive bank as an insurer of unpredictable liquidity demanded by depositors in the sense described by Diamond and Dybvig. The model developed in this paper is able to explain the stylized facts. It considers three key features of a bank: first, the demand deposit contract allows the depositor to run the bank if he believes that the bank’s solvency is insufficient. Secondly, four financial states of the shareholders’ wealth are considered explicitly. Thirdly, the maximization of the shareholders’ expected utility of pay-offs is constrained by the (weakest) condition that the expected yield on equity exceeds the risk-free rate of interest (the ‘yield-on-equity constraint’). In the framework of our model, the unconstrained optima as considered in the existing banking literature imply, first, a high equity-to-debt ratio in the order of magnitude of 0.88 to 1 as well as a loan-to-cash ratio of one. Secondly, the bank is not exposed to any risk at all: it stays both solvent and liquid. When the ‘yield-on-equity constraint’ is taken into account, the constrained optimum may not be contained in the set of unconstrained optima if, for instance, the interest rate differential is small or if the volatility of changes in deposits is large. Such a constrained optimum implies, first, a low equity-to-debt ratio in the order of magnitude of 0.04 as well as a loan-to-cash ratio of one. Secondly, the bank is now exposed to the risk of an insolvency or an illiquidity.