1093-91-287   **Fabian Astic** and **Agnes Tourin*** (`atourin@poly.edu`), Department of Finance and Risk Engineering, Six MetroTech Center, Brooklyn, NY 11201. *Optimal bank management under liquidity and capital constraints.*

We propose a dynamic model of a financial institution that can invest in both liquid and illiquid assets, and whose goal is to maximize the profit of its shareholders, while complying with some Basel 3-like capital requirement and liquidity constraint.

In this paper, illiquidity is introduced through haircuts that are applied to the illiquid securities when sold. The portfolio is managed dynamically and at any time, liquid assets can be used to buy illiquid assets which typically have a better return and a higher volatility. However, illiquid assets can only be converted into liquid assets at a cost.

We use stochastic control techniques to derive the Variational Inequalities characterizing the dynamic optimal portfolio allocations, as well as the shareholders' optimal gain. Unfortunately, we cannot obtain closed form solutions. Instead, we develop a numerical method for computing the optimal allocations and the shareholder's gain. We also use Monte Carlo simulations to estimate the debt holder's payoff associated with the computed optimal allocations.

Finally, we study experimentally the sensitivity of the optimal allocations, the shareholder's and the debt holder's gains to changes in the minimal capital, liquidity ratio and haircut. (Received August 19, 2013)

1