3 Volatility, Credit Rationing and Equilibrium Margins

The amplification effects discussed in the previous section can lead to a rich volatility dynamics even if only the amount of equity issuance is limited through a "skin in the game constraint" as in BruSan10. In this section borrowers also face debt/credit constraints and the focus is on the interaction between these debt constraints and volatility of the collateral asset. First, we first discuss papers that show that asymmetric information about volatility can lead to credit rationing. The total quantity of (uncollateralized) lending is restricted by an loan-to-value ratio or margin/haircut requirements. Second, we outline an intersting feedback effect between volatility and debt/collateral constraints. Debt constraints are more binding in volatile environments, which make the economy in turn more volatile and vice versa. Unlike in BGG and KM97, these margin/haircut spirals force experts to delever in times of crisis. This can lead to "collateral runs" and multiple equilibria. We first focus on a model in which margins are an exogenous function of volatility and then discuss a set of papers with endogenous equilibrium margins. In the latter markets are also endogenously incomplete.

3.1 Credit Rationing

Stiglitz and Weiss (1981) show how asymmetric information in credit markets can lead to a failure of the price mechanism. Instead of the interest rate adjusting to equate demand and supply, the market equilibrium is characterized by credit rationing: there is excess demand for credit which does not lead to an increase in the interest rate.[13]

In the model entrepreneurs borrow from lenders in a competitive credit market at an interest rate r to finance investment projects with uncertain returns. Entrepreneurs are heterogeneous in the riskiness of their projects: the payoff of entrepreneur i's project is given by R with a distribution $G(R|\sigma_i)$. While all entrepreneurs' projects have the same mean, $\int RdG(R|\sigma_i) = \mu$ for all i, entrepreneurs with higher σs have riskier projects, if $\sigma_i > \sigma_j$ then $G(R|\sigma_i)$ is a mean-preserving spread of $G(R|\sigma_j)$.

If an entrepreneur borrows the amount B at the interest rate r, then his payoff for

[13]For an earlier discussion of credit rationing see Jaffee and Modigliani (1969), Jaffee and Russell (1976). Subsequent papers include Bester (1985), Mankiw (1986) and de Meza and Webb (1987).