

Option to Default, Contagion, and Equilibrium Credit Rationing

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Abstract

Stiglitz and Weiss (1981) demonstrate that credit rationing of Type II (random rejection of loan applications that are homogenous from the lender's standpoint) may arise as a result asymmetric information between lenders and borrowers. An important condition that has to be satisfied for the Stiglitz-Weiss result to hold is that the riskiness of the loan applicants' pool is an increasing function of interest rate. This condition is demonstrated by Stiglitz and Weiss within a standard Marshallian setting. Lensink and Sterken (2002) show that once the assumption of a Marshallian decision rule is relaxed and the option to wait to invest is accounted for, an increase in interest rates decreases the riskiness of the loan applicants' pool and thus the Stiglitz-Weiss result breaks down. Although the Lensink-Sterken approach provides a useful insight, it suffers from an implicit assumption that borrowers do not derive any value from default. To the contrary, however, the limited liability of borrowers vests them with an option to default. The default option enables the borrower to "sell" a project (or a business) to the lender in exchange for the market value of the borrower's outstanding debt. The option is thus particularly valuable when the expected present value of a project (or a business) approaches or falls below the market value of outstanding debt. By incorporating the option to default, we show that Stiglitz-Weiss result holds in a highly indebted economy, while Lensink-Sterken effect is valid only for a moderately geared environment. This finding is due to the fact that value of the option to default increases in the gearing ratio such that there exists a threshold point when it becomes a major component in project evaluation.

Both Stiglitz-Weiss and Lensink-Sterken models implicitly assume that borrowers are completely independent entities and thus their probabilities of success and default are uncorrelated. In reality, the borrowers' defaults are not only correlated but may also be contagious. The main implication of credit default contagion is that its presence reduces the

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diversification benefits for the lender (as well as equity investors), and we proceed to incorporate this implication in our model. By specifying an exogenous random driver of contagion and its asymmetric effect in the up- and down-market, we show that under different assumption about the relative magnitudes of asymmetric effects of contagion, the model converges either to the Stiglitz-Weiss or Lensink-Sterken results.

Keywords: credit rationing, real options, option to default, default contagion

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