

How does a bank's involvement interplay with a firm's capacity investment? An analysis and comparison of different consortium structures

Abstract

As nonrecourse project finance (rather than financing on a sovereign basis) is becoming more prevalent worldwide, financing institutions have to collaborate more closely with firms to optimize capacity-investment and financing decisions. Under this background, this paper presents a stylized Stackelberg games model, taking into account the firm's capacity investment as well as the bank's interest rate and funding ratio decisions. Consortium structures between bank and firm are formalized into five modes based on industry practice, namely, the integrated consortium, pure shareholder funding, bank as leader, full coordination, and bank as follower. The optimality and equilibrium of each of the five modes are analytically derived, and their existence and uniqueness are demonstrated. Valuable economic insights are obtained through both modeling analysis and numerical experiments, with the main findings including the following: (i) a lack of bank financing leads to insufficient capacity investment and poor consortium performance; (ii) interest rate and funding ratio play important but different roles in the bank's risk management; (iii) the bank's proactivity in leading and coordinating the consortium is critical for the two parties' overall performance; and (iv) if the bank is the follower, the firm's capacity decision

is irrelevant to the bank's loan contract, and the consortium cannot be coordinated to the first-best level of performance.