

**Optimal lending under strategic acquisition and capital regulation:  
an option-based optimization**

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**Abstract**

This paper explores the determinants of the acquirer bank's optimal loan rate based on a firm-theoretical option-pricing model under the maximum net gain from strategic acquisition. The model demonstrates how the nature of the loan (substitutes/complements), loan rate strategies (strategic substitutes/strategic complements) and regulation conditions jointly determine the acquirer bank's optimal loan rate. We find that the acquirer bank's loan rate are negatively related to the proportion of the combined banks owned by the acquirer bank's shareholders and also negatively related to the capital regulation under the nature of the loan complements and the loan-rate-setting complement strategy. Our findings provide an alternative explanation for the acquirer bank's strategies for operating and competing in the lending market concerning bank acquisition behavior.

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*Keywords* : Black-Scholes valuation, optimal loan rate, strategic acquisition, capital regulation.

**1. Introduction**

Expected increases in market share for loans, deposits and other services and geographic diversification to reduce risk by serving markets with different economic profiles and income flows caused by the liberalization of the banking and finance systems have contributed to a surge in mergers and acquisitions in the last two decades.<sup>1</sup> Further adding momentum to this movement, the regulatory authorities have been plagued in many Asian countries who often use mergers and acquisitions since the financial crisis in mind-1997. Merging two banks to create a stronger one is seen as a panacea, thus resulting in more mergers and acquisitions.

In the recent and interesting paper on "Option pricing on stocks in mergers and acquisitions", Subramanian (2004) had adopted the portfolio-theoretic theory as the analytical apparatus and developed an arbitrage-free and complete model in continuous time to price options on the stocks of firms involved in merger and acquisition deals. The principal advantage of this approach is the explicit treatment of uncertainty which has long played a prominent role in discussions of firm behavior, in particular, banking-firm behavior. This approach, however, omits a key aspect of firm behavior, which is assumed that the market structure faced by firms is perfectly competitive.

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<sup>1</sup>We are a bit informal here and use "mergers and acquisitions" and "acquisitions" synonymously.