Chapter 15
A Game Theoretic Approach to Corporate Lending by the Banks in India

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ABSTRACT
A series of corporate loan defaults facing the Indian banks in the post-crisis period of 2008 led to the downgrading of India’s global credit rating in 2012. Against this backdrop, this chapter delivers an insight to the reader into the games that occur between lending banks and corporate borrowers in addition to the games between the banks themselves in lending competition. The chapter covers various strategies of actions in the structures of bilateral monopoly, duopoly, and oligopoly, the Nash equilibrium, prisoners’ dilemma, decision trees, and binomial analysis. In modeling the default probability, the profits of the lender and the borrower, a number of corollaries, one lemma, and one theorem are deduced in this chapter.

INTRODUCTION
An impoverished writer borrows money from several former college friends after finding himself unable to repay a debt. The debt takes on a circular nature where the creditors owe money to each other but the writer walks away (By Shibram Chakraborty, retold by Kaushik Basu to James Lemont).

The official perspective put forth by the economists of the Reserve Bank of India (RBI) towards non-performing loans is that political, economic, social, technological, legal, and environmental factors contribute to the problem of non-performing
loans in the credit portfolios of banks in India. In
the winter of 2003, the RBI articulated in a note
of caution that the domestic banks need to take
sufficient care in terms of framing appropriate
lending policy such as to dare the borrower to
default. This note of caution still remains relevant
because a sharp deterioration of the loan quality
of the major banks of India led to deterioration
of India’s global credit rating at the end of 2012.
Hence, there is a need to analyze the different
forms of actions and games of the banks and their
corporate borrowers.

BACKGROUND

Livemint and the Wall Street Journal (2013)
reported:

1. Many of the infrastructure projects would
reach their project completion deadlines
from the next fiscal year onwards, the time
when they are required to start making the
loan repayments;
2. Outstanding bank loans to infrastructure
firms rose to Rupees (Rs.) 6.9 trillion as of
31 December 2012, up from Rs. 5.96 trillion
a year earlier; and
3. Growth of such credit slowed to 16% in the
12 months ending in December, 2012 down
from 20.5%.

Dun and Bradstreet (2012) observed that many
retailers on the supply side are slowing down their
expansion plans and many real estate developers
are falling behind schedules in their shopping mall
projects due to the continuing credit crunch. The
economic slowdown has deeply affected the Indian
organized retail sector in terms of deceleration in
retail sales growth, footfalls, store expansions,
employment rates and, most importantly, profit-
ability. Previously in a similar note, the Indian
Express (2010) observed that: (i) the RBI hiked
the risk weight on commercial real estate project
loans to 1% from 0.4%; and (ii) there was more
than a 40% increase in loans to commercial real
estate, but side by side nearly 14% of commercial
realty assets were restructured by banks.

CRISIL (2011) observed the number of de-
faults in real estate doubled in December 2011
over the previous year. In 2011, ICRA observed
the following:

1. Historically banks have been taking expo-
sure for state power projects as well as for
independent power projects, but many banks
are approaching the exposure cap on lending
to the power sector;
2. Given the concerns hovering over the pros-
spects of the sector itself, the pace of growth
of credit to this segment could slow down.

Standard & Poor’s (2012) warned that India
could become the first of the BRIC (Brazil,
Russia, India, China) economies to lose its
investment-grade status due to bad loans
which continue to threaten growth prospects
of the economy.

Considering the above dismal state of corporate
lending business facing Indian banks, there is a
need to reexamine the implications of different
aspects of the games between the banks and their
borrowers, and between the banks themselves as
competing lenders.

OBJECTIVES

Against the backdrop of the loan default crisis
mentioned above, this chapter is concerned with
the economic analysis of the following aspects of
the games in the lending business:

1. Success and failure in bargaining
2. Cooperation and non-cooperation
3. Strategies in duopolistic and oligopolistic
structures
4. Nash Equilibrium
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