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# Can Real Options Reduce Moral hazards in Profit and Loss sharing contracts?: A Behavioural Approach Using Game Theory and Agent Based Simulation

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## Abstract

Agency problems between corporate managers and financiers/banks are common issues in corporate governance literature. In this paper we try to reduce the moral hazards problem of corporate managers' profit misreporting as an agency problem in Profit and loss sharing contracts (PLS). To minimize this risk, we propose that the financier/bank sell a real option to the corporate manager giving her the right to gradually own the corporation. Since the share of the financier diminishes periodically we refer to this mode as diminishing PLS.

We use a repeated game theoretical approach by combining diminishing PLS with real options. To test our model, we code a program in Netlogo to create an agent-based simulation environment where we compare case of diminishing PLS with real options and the case without.

We found evidence that under real options cooperation can be sustained by having Managers not misreporting profits. On the other hand, defection occurs under no real option.

We also found that there exists a higher social value under real options than under the case without. To promote this case of high social value, it is necessary to provide the manager with a specified monetary incentive.

This model is of practical use as it allows for the calculation of the real option premium and the monetary incentive to sustain true profit reporting.

**Practicality:**

- This model is of practical use as it allows for the calculation of the real option premium and the monetary incentive necessary to sustain true profit reporting.
- This Model can be used as a decision tool to monitor profit misreporting behaviour for institutions engaged or willing to engage in PLS contracts.
- This Project was partially funded by the IDB development Bank and supported its practicality.

**Contribution/originality**

- No previous model has combined real options with PLS contract and agent-based simulation.