

**Commitment Problem, Optimal Incentive Schemes, and Relational Contracts
in Agency with Bilateral Moral Hazard[♦]**

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Abstract

In a bilateral moral hazard framework, where the principal is also a productive agent, the two requirements on both the agent's and the principal's incentive provisions should be satisfied in designing optimal incentive contracts. In the static framework, only the second best is obtainable if the incentive contract should be based only on the total output. An example is the simple linear sharing rule often observed. Next, it is shown that in a repeated game version, such commitment problem could be solved, and a first best outcome could be achieved through both parties taking *trigger strategies* depending on a public signal. We give an interpretation in the viewpoint of 'reputation' mechanism, and a qualitative characterization on the optimal solution induced in equilibrium for *all* possible discount factors.

Key words Bilateral Moral Hazard, Team Production, Commitment Problem, Linear Contracts, and Relational Contracts.

JEL Classification C72, D82, L23

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REFERENCES

- Aghion, P and P. Bolton (1992) "An Incomplete Contracts Approach to Financial Contracting".
Review of Economic Studies. 59. 473 – 494
- Baker, G., R.Gibbons, and K. Murphy. (1994) "Subjective Performance Measures in Optimal Incentive Contracts" *Quarterly Journal of Economics*, November 1125-1156.
- Baker, G., R.Gibbons., and K. Murphy. (2002) "Relational Contracts and the Theory of the Firm." *Quarterly Journal of Economics*, February 39-84
- Bhattacharyya, S and Lafontaine, F (1995) "Double-sided Moral Hazard and the Nature of Share Contracts," *Rand Journal of Economics* 26(4), 1995, 761-781.
- Bull, C. (1987) "The existence of Self-Enforcing Implicit Contracts," *Quarterly Journal of Economics*, 102, 147-159.
- Chatterjee, K and W.Samuelson, (1983)." Bargaining under Incomplete Information ", *Operations Research*. 31:835-51.
- Edlin, A and Shannon, C (1998) "Strict Monotonicity in Comparative Statics," *Journal of Economic Theory*, 81, July, 201-219.
- Farrell, J., and E.Maskin (1989) "Renegotiation in Repeated Games," *Games and Economic Behavior* 1, 327-360.
- Fudenberg, D and E.Maskin (1986) "The Folk Theorem in Repeated Games with Discounting or with Incomplete Information," *Econometrica*, 54,533-554.
- Holmstrom, B. (1982) "Moral Hazard in Teams." *Bell Journal of Economics*, 13,324-340.
- Legros, P and S.Matthews (1993) "Efficient and Nearly Efficient Partnerships," *Review of Economic Studies* 60, 3, 599-611
- Levin, J. (2003) "Relational Incentive Contracts," *American Economic Review*, 93(3), June, 835-847.
- Macleod, B. and J. Malcomson. (1989) "Implicit Contracts, Incentive Compatibility, and Involuntary Unemployment," *Econometrica*, 57, 447-480.
- Milgrom, P and J.Roberts. (1992) *Economics, Organization and Management*, Prentice-Hall, Englewood Cliffs.
- Nandeibam, S (2002), "Sharing Rules in Teams", *Journal of Economic Theory*, 107, 407-420.
- Okuno-Fujiwara, M (1989) "On Labor Incentives and Work Norm in Japanese Firms" *Journal of the Japanese and International Economies* 3, 367-384
- Rayo, L (2001) "Relational Contracting and Team Incentives" mimeo-graphed, Stanford University.
- Topkis, D. (1998) *Supermodularity and Complementarity* Princeton University Press.Princeton.
- Van Damme, E (1989) "Renegotiation-Proof equilibrium in Repeated Prisoners' Dilemma," *Journal of Economic Theory* 47,202-217.